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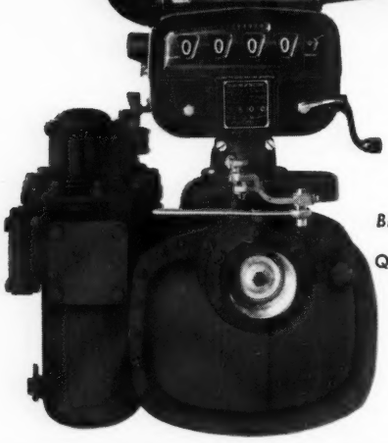
fueloil & oil heat

HOLD OLD CUSTOMERS ...GAIN NEW ONES

. . . with BRODIE METERED FUEL OIL DELIVERIES



Brodie Meter equipped with Brodimatic Quantrol, strainer and air-eliminator.

No one questions an automatic meter-printed delivery receipt. Heating-oil customers know that what goes through a Brodie Meter *shows* on legibly printed Brodimatic delivery tickets. Building confidence and satisfaction holds customers and helps gain new ones. With Brodie Meters equipped with Brodimatic Quantrol Printers, customer deliveries are error-proof . . . even if there is no one at home to receive the delivery. Moreover, spillage and damage to customers' property is avoided. All the operator has to do is preset the number of gallons to be discharged, then turn on the valve. When the exact gallonage has passed through the meter, it automatically shuts off. Delivery receipts are then printed by merely pulling a lever.

Well routed tank deliveries mean greater gallonage per truck-mile and greater profits. Check into Brodie Metering Equipment, today. Write for full details.

BRODIE METERS

PETROLEUM METERING EXCLUSIVELY

SINCE 1927

RALPH N. BRODIE CO., INC., 61ST & LOWELL, OAKLAND 8, CALIFORNIA
Division Offices: CHRYSLER BLDG., NEW YORK CITY • 59 E. VAN BUREN, CHICAGO 5 • 302 SOUTH PEARL ST., DALLAS 1, TEXAS • 221–9TH AVE. NORTH, SEATTLE 9, WASH. • 2101 S. SAN PEDRO, LOS ANGELES 11, CALIFORNIA
REPRESENTATIVES AND STOCKS IN ALL PRINCIPAL CITIES

VOL. 7, NO. 12

fueloil & oil heat

APRIL

1949

Names in the News

Bruce F. Olson was elected president and general manager, Sundstrand Machine Tool Co., Rockford, Ill., at a recent meeting of its board of directors. He advances from the position of vice president and succeeds his father, the late Hugo L. Olson. At the same time *O. G. Nelson* was elected chairman of the board, *Gilmore J. Landstrom* and *Gust H. Ekstrom*, directors, were named vice presidents and *Howard H. Ekstrom* was made assistant secretary and treasurer. Other officers include A. E. Johnson, vice president and Ira J. Shobe, secretary and treasurer.

Robert C. Champlin has been appointed general manager, J. L. Gillen Co., Dowagiac, Mich. Formerly with Richmond Radiator Co. as district manager and for twelve years before that chief heating engineer with Timken Silent Automatic, Mr. Champlin will supervise sales and distribution of Gillen automatic heating equipment.

R. M. Bartlett, formerly vice president in charge of fueloil sales, Gulf Oil Corp., Pittsburgh, Pa., now is vice president in charge of general sales in a new plan of organization for the domestic marketing department. *H. P. Hobart*, previously vice president in charge of lubricating oil sales, was made vice president in charge of product development and product engineering and *H. G. Meador*, up to now division manager at New Orleans, advanced to the position of vice

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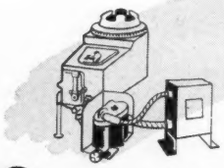
If you like SELLING you'll like selling H. C. LITTLE!

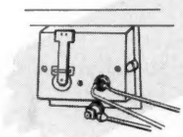
No Other Vaporizing Oil Heating Equipment Offers All Nine of These Sales Features!

1 **H. C. LITTLE FURNACES AUTOMATICALLY LIGHT THEMSELVES**
Automatic Operation With Exclusive H. C. Little Electric Ignition—No Pilot Light.

2 **EFFICIENT COMBUSTION WITH CATALYTIC OIL**
Exclusive H. C. Little "Catalytic Heat Control" Now Standard Equipment and Available for Modernization of Existing H. C. Little Installations.



3 **NON-MECHANICAL OIL BURNER**
Exclusive, Patented, Elongated Design—no motors, no blowers, no moving parts to wear out or need service.



4 **QUICK STARTING WITHOUT BLOWER**
Exclusive H. C. Little Quick Starting Control—Thermally operated. Automatically admits extra air for starting.

5. EASY ACCESS BURNER DOOR for inspection or cleaning.

6. AUTOMATIC OIL CONTROL and Safety Trip with thermally controlled double shut-off.

7. PATENTED THERMO LIMIT Safety Control.

8. LOW VOLTAGE IGNITION TRANSFORMER does NOT cause radio interference and is very ECONOMICAL.

9. WRITTEN FACTORY GUARANTEE of one year on entire unit and up to 10 years pro-rata on parts.

Address inquiries about dealerships to Dept. 4

H. C. Little Burner Company — **SAN RAFAEL, CALIFORNIA**

FACTORY REPRESENTATIVES IN 18 PRINCIPAL CITIES

In the Battle for Sales— H. C. Little is the Winner!

president, supervising marketing through divisional sales organizations.

M. L. (Larry) Judd has been appointed manager of the warm air furnace division, United States Radiator Corp., Detroit, Mich. Mr. Judd formerly was sales manager of Delco Appliance Div., having joined the division in 1931, and specialized in the sale of automatic heating equipment. He is a graduate of Allegheny College, Meadville, Pa. and from the Harvard Graduate School of Business Administration.

Carlos Morgan has been named acting advertising manager, Penn Electric Switch Co., Goshen, Ind., succeeding J. R. Netedu, who resigned to enter the advertising agency business. Mr. Morgan has been with Penn for the past thirteen years, formerly was assistant advertising manager, has been connected with its advertising activities for several years.

Arthur Hanson has been receiving congratulations on completion of thirty years' service with L. O. Koven & Bro., Inc., and its subsidiary company, Waterfilm Boilers, Inc., Jersey City 7, N. J. He began with Koven as an accountant, soon became office and credit manager and instituted a new cost accounting system. In 1929 he was made manager of range boiler sales, in charge of a sales force of two men. Today his salesmen and representatives have increased to two dozen, with sales advancing proportionately. He is a naval veteran of World War I and his three sons served during World War II. S/Sgt. Arthur Hanson was killed, but the other two sons, Kenneth and Donald, returned and are employed in Koven's sales department. Mr. Hanson is active in business and church organizations and a member of the board of directors of Koven's 25-year club.

The NEW! NEW! NEW!

Luxaire PRESSURE VAPORIZING OIL FIRED UNITS EXCELL IN EVERY FEATURE!

Tightening 4 screws, speedily mounts the completely assembled, factory adjusted burner in its correct position in the furnace.

Luxaire's 1949 line of vaporizing oil fired units are new in every important detail—They are outstandingly new because there is no similar unit on the market that excells them in:

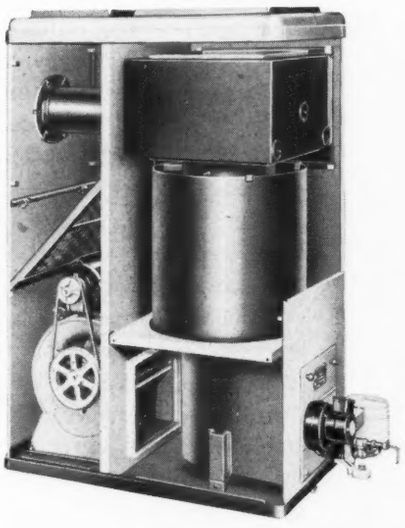
- Extracting all the heat possible from the oil burned.
- Maintaining a uniform, clean flame.
- Dissipating carbon deposits that may accumulate.
- A design that provides a remarkably simple, quick method for inspecting or servicing, if necessary — just remove 4 screws.

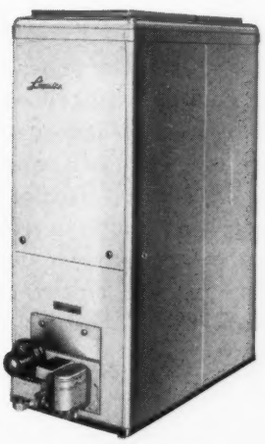
Luxaire heating units are factory assembled—all ready for installing the factory assembled—factory adjusted Pressure Vaporizing Burner. Complete assembly requires just a few minutes with the new burner mounting plate—just tighten 4 screws.

This new Luxaire line "lets-you-in" on the market demand for good looking, high quality—competitively priced, automatic heating units. They are Underwriter Laboratories approved to burn No. 3 fuel oil and lighter domestic grades.

See your Luxaire jobber for complete details.

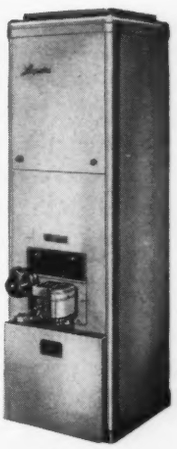
Interior View of Air Conditioning Unit.





No. VA-65
Air Conditioning Unit,
76,000 Btu Output

No. VH-75
Utility Unit,
75,100 Btu Output



No. VG-61
Gravity Furnace,
60,600 Btu at Register

THE C·A·OLSEN MANUFACTURING COMPANY

Luxaire HEATING & AIR CONDITIONING UNITS

ELYRIA 12, OHIO

fueloil & oil heat

Editorial Leaks

Fueloil supply no longer is a problem to oilheating men, though it is creating a problem of over supply in the petroleum industry. This shift makes necessary a change in thinking in both industries from the pattern of a year ago when nobody knew exactly how the fueloil supply job was going to be done.

There is a feeling in this field that now the fire has been put out we should disband the fire department. It is felt by some that money we have spent on publicity now can be "saved" safely. It is hard for us to go along with this thinking on economy because there is no indication that the fire is completely out. There smolders in the ruin of the oil shortage a number of embers that still can cause us damage.

The chief function of publicity is not defensive. It is positive and aggressive. The exact damage to the oilheating industry that still remains as a result of the adverse supply situation is not definitely known, but is believed to be considerable. We have yet to build back public confidence in burning oil, and do it rather fast. We will need the help of every interested element in the business, and not all of them are yet ready and willing to help.

We face in the near future much harder competition from other fuels than we have had for the last eight years, and that will require preparation—if we meet it successfully—that cries for expert public relations help. When the market is slipping away to other fuels, it is late to start preparing a defense. That job should be done now, and done fast.

◈

Though nobody has said so, we have the feeling that many of the old hands in the oilheating business are dreading to go back to work. All admit that they have few problems that more business would not solve, but too few have yet done anything concrete about getting the additional business they need. Manufacturers and dealers alike seem to be doing busy work in an attempt to put the real problem over until tomorrow or next week.

Those who have been in the oilheating business ten years or longer came in when competition was much keener than it has been in the last eight years. They built their businesses well enough to survive the war years, and have been reasonably prosperous supplying the demand since the war ended. Now we are entering a competitive period much like 1940 and 1941, and many feel, "This is where I came in." They have no stomach for rebuilding a sales force and reentering the familiar tilts that are the essence of normal American business. It is more pleasant to select our customers from those who apply for permission to buy the available materials.

But the sellers' market is ended. The decision to start back to tough, competitive selling is not an easy one. It is being delayed dangerously long, seemingly with the hope that something will happen to make it unnecessary. There is nothing in sight that looks remotely like 1947 for the immediate future, and much that indicates a more competitive era ahead than we have seen for many years.

Barring a war, which would push the oilheating industry near oblivion, men in this industry have three alternatives. They can get up and leave, if this is where they came in. They can stand around until they are forced into bankruptcy, or they can reinstitute those proven business-getting practices that built their businesses at the start.

Every day right now is important. No amount of close and frenzied attention to unimportant detail can make up the current hours forever lost to building sales. The problem must be faced, and faced soon.

◈

The oilheating industry again is primping for its 26th Annual Convention to be held at Boston in May. Much of the interest in these annual conclaves is centered in the exposition, at which new equipment frequently is unveiled. Unfortunately, the convention sessions too often are scantily and tardily attended, in spite of the value the discussion may have.

The social side of any convention has its definite place and worth. In many years of attending meetings we have seen too many discussions at the bar which out-weighed the orations of the speaker upstairs. This may account for the poor attendance records too many conventions show, though a more or less hard-working convention committee got the best men available for their subjects.

What brings up these thoughts is the apparent quality of the program arranged for the Boston sessions. It is to be hoped that members of the industry who will spend important amounts of money to visit Boston during convention week will participate in the meetings and the discussion. The sessions can be as valuable as the audience wants to make them.

◈

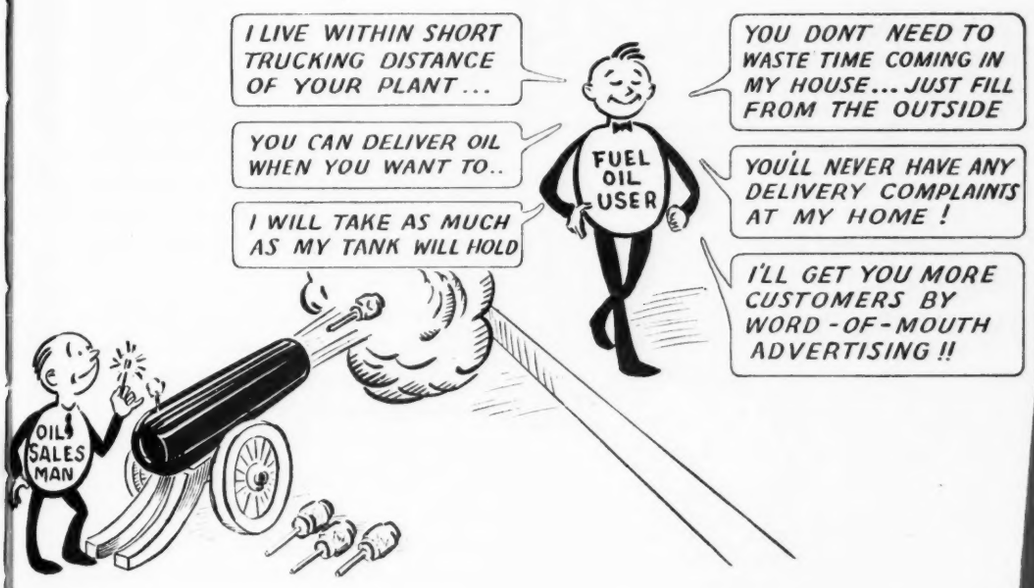
Secretary Krug of the Interior Department released an overdue annual report in March and though it is said to have been considerably toned down before its release, it still sounded as though Harold Ickes might have written it in an expansive and forgiving mood. He shook his finger at the American public for using their oil for heating, for power and for their diesel locomotives.

Krug's report did not say the country was practically out of oil, but it left no doubt that the country is being prodigal in its use of petroleum. He did not indicate how the plant necessary to produce, refine and transport oil for some future "emergency" could be maintained without being developed and used.

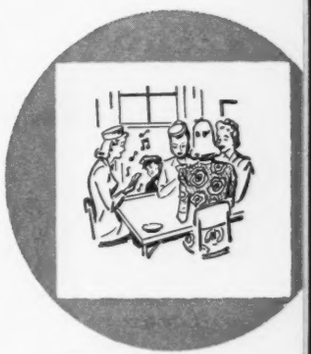
For 75 years we have been warned by one soothsayer after another that we are on the verge of an oil drought. It is interesting in looking at the record that these scares almost without exception have originated with some branch of government. Men in the industry who are responsible for delivering products to meet the demand seldom are scary over future shortages. The telescopic crystal-gazers always are practically sure that the petroleum in sight is about the last that can be discovered.

Secretary Krug hardly could get much attention with a shortage boogey-man at this time of oil surplus, but he too feels this oil may be near the last we can find. Can't we have a synthetic program and a foreign development program without the perennial shortage scare?

A *Sales Plan* FOR SECURING *Profitable* KEEP-TANK-FULL ACCOUNTS


I LIVE WITHIN SHORT TRUCKING DISTANCE OF YOUR PLANT...
YOU CAN DELIVER OIL WHEN YOU WANT TO..
I WILL TAKE AS MUCH AS MY TANK WILL HOLD
FUEL OIL USER
YOU DONT NEED TO WASTE TIME COMING IN MY HOUSE... JUST FILL FROM THE OUTSIDE
YOU'LL NEVER HAVE ANY DELIVERY COMPLAINTS AT MY HOME !
I'LL GET YOU MORE CUSTOMERS BY WORD-OF-MOUTH ADVERTISING !!
OIL SALES MAN

Eliminates old-fashioned tank measuring



Oil man need never enter the home

Safe full tank deliveries even if no one at home

FREE: Complete SALES PLAN for building BETTER and MORE PROFITABLE customers

On a straight money basis, a keep-tank-full account is worth $4.00 to $9.00 more per year to you than a customer who phones in when he wants oil. *Extra profit* is yours next winter if you set your accounts up on an automatic delivery basis *this spring*.

TELL 'EM and SELL 'EM

Tell them what you are going to do for them! Sell them on what you expect them to do for you!

Many of the smartest oil marketers in the country have used this productive VENTALARM Fuel Oil Sales Plan. It's completely covered in the booklet shown at the right. We'll be glad to send one for each of your fuel salesmen.

For new or old accounts, it's an Ideal Plan to make Ideal Customers.

Write us today for contract-getting booklet

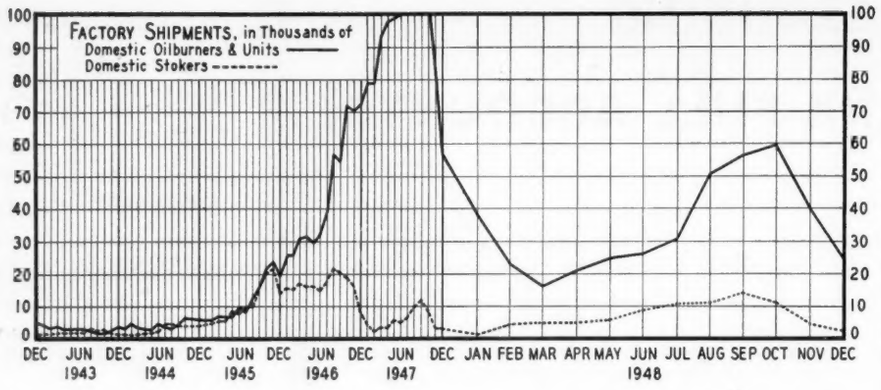
Model LC with quick slip-fit for old tanks

VENTALARM®

Whistling Tank Fill Signal

SCULLY SIGNAL CO., 76 FIRST ST., CAMBRIDGE 41, MASS.

Canadian Licensee—**EMPIRE BRASS MFG. CO., LTD., London, Ontario**

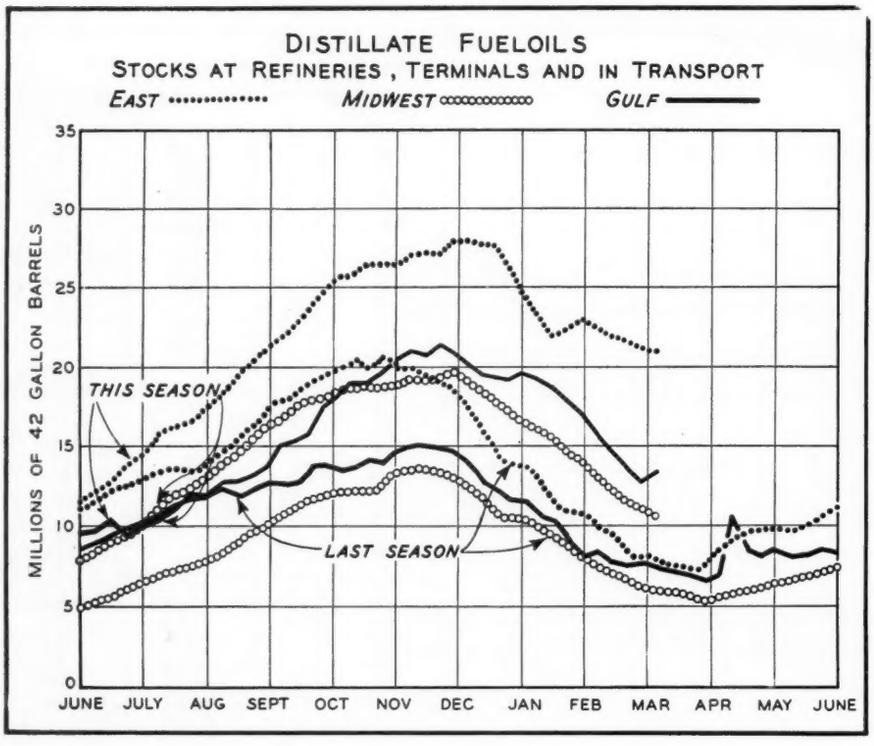

FACTORY SHIPMENTS, in Thousands of
Domestic Oilburners & Units ——
Domestic Stokers --------
DEC JUN DEC JUN DEC JUN DEC JUN DEC JUN DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
1943 1944 1945 1946 1947 1948

Shipments of Oilburners and Units

(Including Exports)

Adjusted to include manufacturers other than the 152 reporting to Census Bureau, FUELOIL & OIL HEAT'S estimates of shipments are:

	JANUARY			TWELVE MONTHS		
	1949	*1948*	*Percent Change*	*1948*	*1947*	*Percent Change*
Conversion	20,327	25,285	— 19.6	287,829	943,185	— 69.5
Boiler units	1,679	2,534	— 33.8	38,187	57,906	— 34.1
Furnace units	3,693	10,303	— 18.1	86,843	194,121	— 55.3
All domestic	25,699	38,122	— 32.6	412,859	1,195,212	— 65.4
Commercial	1,878	2,785	— 32.6	28,433	53,993	— 47.3
Total	27,577	40,907	— 32.6	441,292	1,249,205	— 64.7



February Minimum Retail Prices: Key Dealers

	CONVERSION BURNERS	BOILER-BURNERS	FURNACE-BURNERS
Feb. Aver.	$342	$684	$611
Jan. Aver.	340	688	612

Price Index: Conversion Burners: January 1949 is 100%

WHOLESALE				RETAIL			
Feb.	139.3	Six months ago	144.8	Feb.	145.6	Six months ago	149.6
Jan.	138.3	Year ago	145.0	Jan.	145.2	Year ago	149.6

Oilheating Trends

THE PRELIMINARY estimate of domestic oilburner and unit installations in February is 24,823. This is a low figure alongside of January's 30,158 but it is significant in being the first monthly estimate in more than a year that exceeds the same month of the previous year. In other words, the February estimate is 7½% above the 23,083 of February 1948, and it is reasonable to expect that this month was the turning of the tide toward the higher anticipations for the new year.

The approximate division of February sales by applications was: New Homes 9,929; Replacements 5,958; and Conversions from other fuels 8,936.

BURNER STOCKS: Estimated stocks of domestic oilburners and units in dealer hands at the end of February was 62,741, a moderate drop from the previous month which ended with stocks of 71,736. Factory stocks on December 31, latest available data were 45,951.

SERVICEMEN'S TRANSPORTATION: As a result of a request from one of the reporting dealers the group was asked this month how they handled servicemen's transportation. Approximately 40% of all servicemen travel in their own cars and the remaining 60% use company cars or trucks. Where servicemen get about from call to call in their own cars, they are compensated by quite a variety of methods. The largest percentage (44%) are paid on a simple mileage basis. The next largest group (22%) is reimbursed on a strictly cost basis — gasoline, lubrication, repairs, insurance, etc.—and the next largest group is paid for driving personal cars by an addition to the hourly wage rate. Then, 12% are given so many dollars a week for the use of their cars; 4% have a specific monthly dollar payment for this purpose; 2% are paid a specific amount per call; and 2% have the transportation cost included in their base salaries.

Among those who are paid mileage rates, the figures run all the way from five cents to ten cents per mile but the average of all servicemen compensated this way was seven cents per mile. Those companies that simply pay the operating cost of the cars such as gasoline, oil,

repairs, etc., must reflect the greater costs of car ownership in the wages paid the men, since depreciation is a big factor not listed in costs.

Those companies that pay the men a specific amount per hour for the use of their cars mostly pay either 30 or 35¢ but there are several variations to this plan. For example, one company mentions paying 20¢ per hour plus oil and gas, another pays 20¢ per hour plus 2¢ per mile. Those that pay a specified amount per week also have combination deals as a rule. Some run as low as $6 per week and as high as $12.50 without any extra consideration. Most, however, in using a weekly basis pay somewhere between five and ten dollars per week, plus gas and oil. One curious arrangement was described in which the dealer pays half the cost of the car and half the cost of all operating expenses. This is a small dealer with only one serviceman.

Dealers who pay by the month arrive at rates similar to the weekly ones described but just spread over a longer period. For example, one pays $60 a month flat, while another pays $25 per month, plus 4¢ per mile.

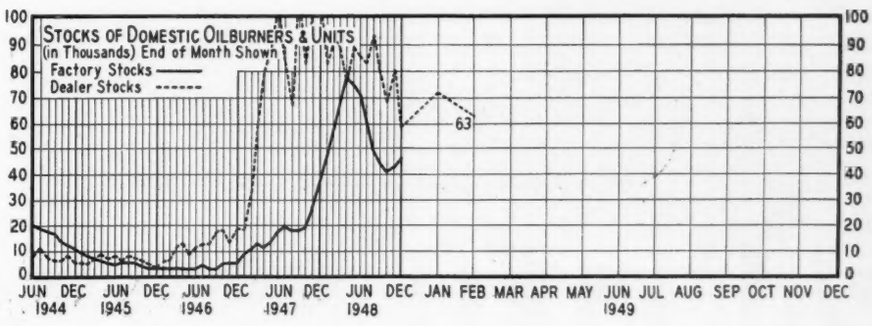
CREDITS AND COLLECTIONS: Asked how their credit experiences today compare with six months ago, only 3% of the reporting dealers say they are better, while 52% say they are worse and 45% report no appreciable change. The average amount of accounts receivable standing on the books on March 1 was equivalent to the previous thirty-eight days' billing. When this same factor was checked last September, accounts receivable at the end of the month represented only 30 days' billing. The number of customers on a C.O.D. basis has also increased during the past six months from approximately 9½% to 12%. This whole analysis of credits has to do primarily with fueloil accounts, particularly the C.O.D. ratios. The improving price picture on fueloil may slightly affect credits, but the chances are that most of the tightening of credits is due to somewhat smaller pay envelopes in a number of industries. In all probability collections are fully as good as they have ever been in normal times, but logically they are somewhat slower than during the very flush and easy money years just following the war.

(Continued on page 122)

Oilburner* and Building Permits

OILBURNERS					DWELLINGS			
February		2 MONTHS			February		2 MONTHS	
1949	1948	1949	1948		1949	1948	1949	1948
15	0	..	0	Albany, N. Y.	..	..	..	..
128	86	539	346	Baltimore, Md.	109	91	129	387
..	..	..	..	Binghamton, N. Y.	2	3	14	3
..	..	..	..	Bloomfield, N. J.	2	..	3	..
..	358	..	950	Boston, Mass.	9	13	15	48
35	68	134	150	Bridgeport, Conn.	..	..	..	..
..	..	..	..	Buffalo, N. Y.	13	15	31	38
..	..	..	..	Des Moines, Iowa	20	33	30	68
520	570	..	..	Detroit, Mich.	429	578	611	1037
31	64	84	140	Elizabeth, N. J.	1	0	5	0
20	7	34	18	Freeport, N. Y.	..	..	..	..
..	..	..	..	Greenwich, Conn.	12	8	19	13
..	..	..	..	Hackensack, N. J.	3	7	3	7
75	69	194	132	Hartford, Conn.	..	..	..	..
14	3	20	4	Irvington, N. J.	1	2	1	2
..	..	..	..	Lynn, Mass.	9	2	15	5
37	17	43	75	Meriden, Conn.	..	..	..	..
177	121	432	274	Milwaukee, Wisc.	21	43	82	113
63	125	147	264	Minneapolis, Minn.	23	60	56	90
5	13	17	24	Montclair, N. J.	..	..	..	..
..	..	..	..	Morristown, N. J.	11	0	0	0
12	10	31	17	Mt. Vernon, N. Y.	..	..	..	..
..	16	..	33	Newark, N. J.	..	..	..	..
120	62	192	124	New Bedford, Mass.	..	..	..	..
18	20	61	38	New Haven, Conn.	..	..	..	..
0	0	0	0	New Orleans, La.	..	..	..	..
10	9	21	21	New Rochelle, N. Y.	3	7	3	8
..	4652	..	9947	New York City (total)	..	..	..	..
..	4361	..	9217	Brooklyn-Queens	..	..	..	..
291	291	707	730	Manhattan, Bronx, Rchd	..	..	..	..
112	96	185	172	Norfolk, Va.	34	31	66	68
3	0	3	0	Oakland, Calif.	..	..	..	..
..	93	..	275	Omaha, Nebr.	..	..	..	..
2	7	10	12	Orange, N. J.	1	0	1	0
13	18	24	23	Passaic, N. J.	..	..	..	..
21	10	37	20	Paterson, N. J.	6	3	7	13
240	178	585	521	Philadelphia, Pa.	..	..	..	..
..	..	..	..	Plainfield, N. J.	6	1	8	3
12	17	34	38	Portland, Me.	2	0	4	0
625	328	1029	689	Portland, Ore.	97	153	225	274
6	7	16	33	Poughkeepsie, N. Y.	..	..	..	..
34	24	84	72	Providence, R. I.	6	2	11	2
..	..	..	..	Reading, Pa.	3	0	6	1
71	63	185	185	Richmond, Va.	57	60	114	134
111	62	255	120	Rochester, N. Y.	..	..	..	..
8	15	37	31	Rockville Center, N. Y.	7	18	7	26
23	10	44	26	Salem, Mass.	4	1	7	1
103	50	210	172	St. Louis, Mo.	..	17	..	51
94	85	255	312	St. Paul, Minn.	31	36	35	72
53	73	90	187	Schenectady, N. Y.	..	..	..	..
..	..	..	..	Seattle, Wash.	79	107	160	368
..	..	..	..	Springfield, Mass.	15	13	30	29
44	64	95	88	Stamford, Conn.	..	..	..	..
25	..	86	..	Syracuse, N. Y.	7	15	22	20
..	..	..	..	Trenton, N. J.	1	0	2	0
..	..	..	..	Utica, N. Y.	0	7	1	9
92	126	207	234	Washington, D. C.	..	..	..	..
..	..	..	..	West Orange, N. J.	4	5	8	7
5	4	13	27	White Plains, N. Y.	3	2	22	15
69	15	120	93	Wilmington, Dela.	3	1	3	4
..	66	..	157	Worcester, Mass.	..	..	..	..
19	23	36	32	Yonkers, N. Y.	..	..	..	..
3356	2810	6137	5444	*Totals*	1032	1317	1753	2864
+19.4		+12.7		*Percent Change*	—21.7		—38.8	

*Permits are not total sales in each market since none are reported from suburban areas, which normally account for 20% to 60% of total sales in each market; nor are they an accurate index where enforcement is lax. Rightly used, however, they are a useful working index.



PANELOX* leads again!

Now—Square and Rectangular Combustion Chambers in Heat-resisting Stainless Steel

ROUND. New design! New flat port panel for easier sealing of burner gun—reinforced with top and bottom flange. Seams strengthened to prevent warping.

● It's news—and it's hot! Famous Panelox Stainless Steel Combustion Chambers are now available for square and rectangular installations!

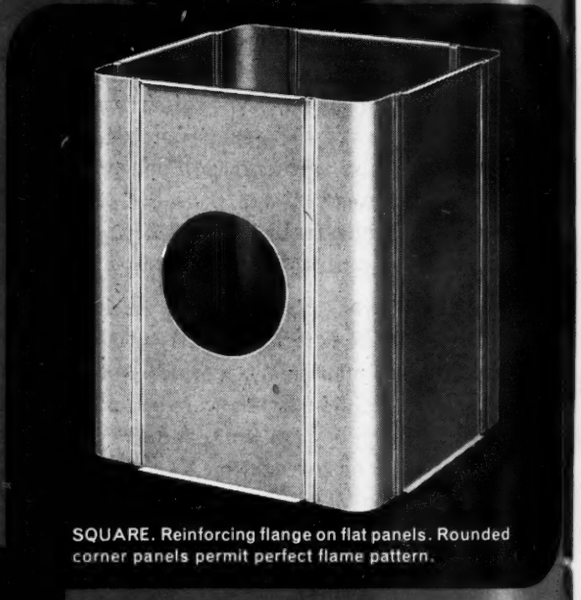
Now you can fit Panelox chambers to any size or shape domestic firebox. Now you can cover the entire conversion and replacement markets. Now you can offer all your customers the advantages of Panelox superiority.

Rounded corner panels eliminate air pockets, reduce flame roar and turbulence. Reinforcing flanges on flat panels prevent distortion and warping, assure maintenance of original shape. Panels made in several widths for easy fitting to a wide range of chamber dimensions.

Get *all* the facts *now.* Climb on the Panelox bandwagon—and be set for big sales in the months ahead. Write, wire or phone for full details.

STEFCO STEEL COMPANY
Heating Equipment Div., Michigan City, Ind

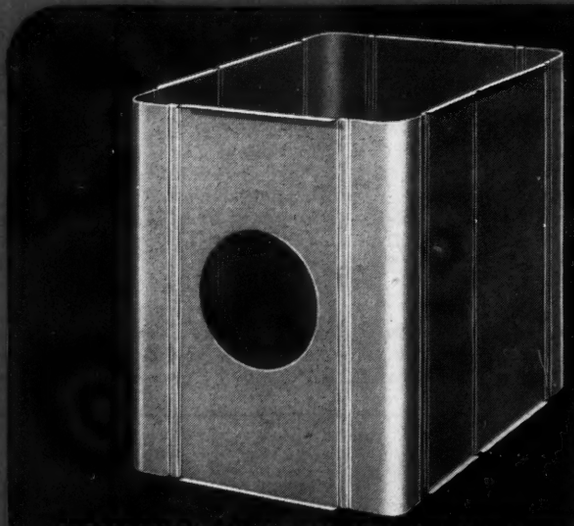
*Trademark



SQUARE. Reinforcing flange on flat panels. Rounded corner panels permit perfect flame pattern.

Easy to install—no backfill, no tools, no cementing, no need to remove old chamber.

Four thicknesses at seams—provides extra strength, rigidity.



RECTANGULAR. Provides more combustion area in narrow fireboxes. Easy to fit any size or shape firebox.

- **Finest heat-resisting stainless steel**
- **Interlocking panels slide together without tools**
- **No backfill or cement required**
- **Light weight, easy to handle**
- **No breakage in shipment**
- **Installed in minutes, heats up in seconds, stands up for years**
- **Saves fuel—reduces noise—provides more uniform heat**

PANELOX® HEAT-RESISTANT STAINLESS STEEL COMBUSTION CHAMBER for OIL BURNERS

A Pilot for Sales

Duties and Functions of the Man in Charge of Business-Getting

by
Ray Horan

EVERY OILHEATING firm, regardless of size, must have somebody responsible for sales. This essential function of a successful business cannot be left to chance or to the fond hope that by some miracle all salesmen will do all the things they should do; find and train themselves and dig out new business with the regularity necessary to a healthy operation. A sales machine needs a pilot as much as an airplane or ship if it is to arrive safely at the place it is supposed to go.

Every large sales organization needs a full-time salesmanager whose sole responsibility is the creation and maintenance of the business-getting force. Medium size dealers may have a part-time salesmanager who probably will have other duties. He may be the general manager, service manager, office manager or superintendent, but he must perform all the duties of salesmanager as far as time will permit. In the small dealership the proprietor probably will serve as his own salesmanager, and since his time for sales functions will be limited, he must have a definite plan to train and supervise his one or two salesmen. The men responsible for sales in each of the classes of dealership have definite duties of varying scope.

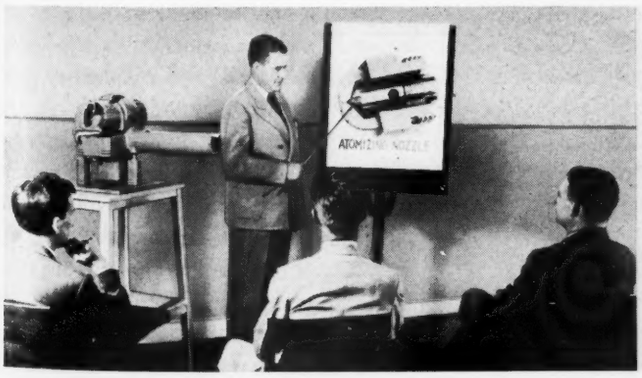
In the large organization—with seven to seventy salesmen—the salesmanager has five well-defined functions: (1) market analysis to determine the amount of business the firm should get, and the number of salesmen needed to get it; (2) sales force recruiting; (3) initial or preliminary training; (4) advanced or scientific (psychological) sales training, and (5) the continuous training and supervision which keep the force functioning at its best.

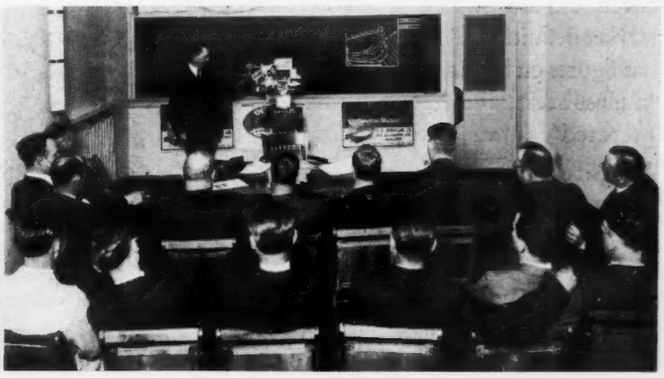
At least the last four of these functions are continuous and will require the full time of the salesmanager in the large organization. If he keeps his force at full strength and producing at its best, there will be no time for other duties. To keep ten, twelve or twenty salesmen producing at their potential peak is the most important job in the organization, and when properly done there will be no need for the manager to be concerned with other duties or departments.

In the medium size organization—of perhaps three to seven men—the part-time salesmanager should perform the same functions, but on a reduced scale consistent with the time available from his other duties. Since the sales job is so important to the success of the business, the managerial functions should not be slighted. It is advisable to get an assistant to help with some of the other duties, rather than skip or neglect any of the essential functions of a salesmanager.

The proprietor of a small dealership must manage his own one or two salesmen. He will not have the time to do so complete a job as the large and medium size operations afford, but he should plan to give a definite part of his time to sales. He probably will recruit the man or two he needs from the neighborhood, or from among his other friends. Since he cannot spend the time others will on training, he should prescribe a course of reading to acquaint the man with the industry and its products and functions. He can investigate adult education courses, or subscribe to correspondence school courses in selling for his men. He can assign the man to various duties around the shop that will acquaint him with the equipment and its functions, and take him on sales and service calls to broaden his experience. Training will be slow.

Some small dealers have found that a compulsory series of questions from the new man helps to speed his education. It may be required that the man have twenty questions about the business ready for each Saturday morning or any designated time each week. The answers to the questions will help the training process, but the type of question will





Two types *of sales training schools are shown above. The Delco-Heat school on the left illustrates the small group, enabling the instructor to give individual attention to each student. Schools, similar to the S. T. Johnson session shown on right, on the other hand, permit a larger group to receive specialized and intensified training in sales and technical fundamentals.*

afford the dealer an insight into the man's comprehension and grasp of the business as his training progresses. But training must not be confined to weekly conferences. Some time should be given to each man each day.

Market Analysis

Any man responsible for sales must know first what the sales potential is for his firm in the area it can cover. The total area covered for oilheating equipment must not be larger than the mechanical departments can serve adequately. Unlike some of the "package" consumer goods and "soft" consumer goods, oilheating equipment must be serviced promptly; must be followed to assure complete satisfaction, and must be supplied with fuel. If the dealer is not in the oil business this last consideration may not be important, but if he plans to control the service on the installation, and use the customer for future sales the organization must be able to reach the customer quickly when service is needed. Ten-day service may be satisfactory on a washing machine or a kitchen mixer, but not for oilheating equipment in winter weather.

The first step in defining territory is to get a city or county map and mark the boundaries of the area that can be efficiently covered.

Next step is to determine the number of homes in the area with a present-day value of $6,000 or more. If valuations available are on the basis of the 1940 census it may be safe to use $4,000 as the low limit of valuation. There are various sources of this information in most cities. Local newspapers generally have complete statistics on the area they cover, and are anxious to help with any market definition. The Real Estate Board has figures on homes and their valuations in most areas, and frequently has maps prepared showing the locations of homes.

Housing figures from the federal census of 1940 are available for individual cities from the Bureau of Census, Washington 25, D. C. These figures are broken down into "census tracts" which help to locate the homes by valuation. Most newspaper figures are based on these census data, and may be more nearly up to date than the original figures, now nine years old. If the dealer does not want to buy the data from the Bureau of the Census, it is probable that he can find it in his public library. Data collected in 1940 will be badly out of date in some cities which were much affected by war construction, and the dealer will have to rely on his personal knowledge of his city to revise the figures. This revision should be made sparingly since impressions and hunches based on the memory of old residents are unreliable. Neighborhoods change without fanfare, and many a dealer has been surprised to find that the area "across the tracks" is a much better market than East Main Street. Market data compiled by aggressive newspapers usually are reliable and up to date.

When the number of eligible prospects—homes with a present valuation of $6,000 or more—has been determined and located, sales territories can be laid out. Each area will require one full-time salesman and will contain about 3,000 owner-occupied homes with a sufficiently high valuation to be prospects for central oilheating. The homes of lower valuation can be sold oilfired space heaters and ranges. All are prospects for water heaters.

The third type *of sales training schools, where a large group of Moduflow salesmen were trained in principles and sales applications.*

Recruiting

Details of sales recruiting and the points that follow will be covered more completely in future articles, since they are the most important functions of a good salesmanager, and in large sales organizations they are continuing jobs.

Recruiting salesmen is a straight sales job for the salesmanager. It is a constant challenge to a man's sales ability to sell men on a career. The sale must be made with the long range in view. It is not a one-call sale, but one in which the manager will have to live with the man and keep him sold during his term of employment. The man should be convinced that he is getting into a worthwhile business; that it is a career worthy of his best efforts.

The new man must be sold on a slow start in the business, but be shown that the long training period is worth his effort for the long-range possibilities. There are five considerations that must be sold to the new man; (1) the soundness of the business; (2) its long-range potentialities; (3) the character of the firm; (4) the character and understanding of the salesmanager; and (5) the salesmanager's ability to teach the man the business. The sales director doing interviewing should build his sales story around these five points.

Like any other good sales story, the one that sells a man on a new career should be prepared by writing it. The story should be able to stand up by itself on paper, or it should not be told. Some managers object to taking the time to write an interview, but the time it takes is saved many times by increasing its effectiveness in the many interviews in which it will be used. The manager must keep in mind that he is selling a man on his future. It is a serious session for the prospective salesman and it cannot be

treated lightly by the salesmanager. It is a really big sale for the salesmanager to make, but if he cannot sell men into the business, he is in the wrong business himself.

There is one more interview it is wise to hold; a meeting with the salesman's wife. It should be explained to her that much of an oilheating salesman's work is done in the evening when he can reach husband and wife in their own home; that he may be late for dinner occasionally and miss dates to play bridge or go to the movies. At the same time she should also be sold on the possibilities for security in the job. An enthusiastic wife can be very useful to the salesman —and to his salesmanager.

Initial Training

The third duty of the salesmanager is to give the man his initial training. This consists chiefly in getting him acquainted with the business in general. It must cover the rudiments of heating, heating plants and systems. It should cover the various fuels, their heat contents and comparisons; surveying radiation and heat loss; burner types and their competitive aspects; and the firm's own equipment, its features and its points of superiority. This should take two to three weeks. During this time the man will have all he can absorb to get familiar with the new field without attempting to learn any of the specific details of selling.

Advanced Training

By the end of three weeks the man should have the fundamentals of the business well enough in mind to take up the science of selling. This advanced training has to be taught in easy stages.

First, the man should be taught to find and qualify prospects, and start to build a prospect list. He should be taught the technique of using the user, contacting builders and real estate firms; taught to tell everyone the business he is in and ask for prospects. He should be conditioned to cold canvass.

Next the man should be taught a presentation that embodies the history of his company, the quality of the equipment and the service his firm renders. When he has this presentation well in hand, it is time the manager or supervisor take the man out on a few sales calls to show him how the story is presented, how objections are handled and how to keep the interview in the right channel.

Finally the man must be taught to close. This, like the man's previous training, must be taught in easy stages as he can digest and master the material. If it is fed to him faster than he can absorb it, he will get discouraged and want to quit. Since the effectiveness of any salesman is bound closely to his enthusiasm and self assurance, any chance of discouragement should be studiously avoided.

Continuous Training and Supervision

The final duty of the salesmanager is the never-ending effort to improve his men and increase their individual effectiveness. He must be always alert to supply his men with ideas and information that will make them better salesmen. He must make each man conscious of the self-improvement he is attaining and the strength he is gaining. It is only by this incentive that the man will continue to invest his time and energy to become more effective.

Weekly sales meetings have proved a good investment in morale building and as a source of instruction, but they should be skillfully handled to avoid making them a boring duty that the men accept as a penalty of the job. The atmosphere can be light without being frivolous. Some firms serve coffee and a piece of pastry at morning meetings. This can be followed by a pack of cigarettes or a cigar on the house, and a little prize can be awarded for the best idea, the best sales story, or the man with the highest dollar volume in the week before the meeting. The cost is small and the reward is great in attention and serious work at the meetings. Each meeting should have both technical and sales discussions to appeal to all the men.

Sales supervision is generally understood by most salesmanagers, but there is a proved technique for handling men. Every man who comes to the office in the morning should have five or ten minutes with the boss. The salesmanager should show an interest in the previous day's work, ask for a quick outline of today's schedule and try to offer a suggestion or two on the particular prospect the man will work that day. He must go out enthusiastic and with the feeling that the organization is firmly behind him and interested in his progress and success. A little show of interest, a suggestion and an offer of help is appreciated by everybody.

Depending on the size of the organization, all these duties of a salesmanager must be performed to a greater or lesser degree by a full-time salesmanager, part-time manager or the proprietor. The important thing is to see that someone does something about each function and is held responsible for doing it.

Court Rules Against Unfilled-Order Commissions

SALES COMMISSIONS amounting to $146,000 on unfilled orders taken in 1945 and 1946 were denied J. A. Fox, a former salesman for Silent Sioux Oil Burner Corp., Orange City, Ia., after a jury trial lasting two months and one day. Suit filed May 14, 1947 went to trial January 17, 1949 and a verdict denying the commissions was reached March 18.

A jury of fourteen was selected to avoid a mistrial, and both extra jurors were used.

Oilheating Task Group Reviewing Emergency Rules

A TASK GROUP TO review orders and suggest procedures for the oilheating industry in the event of another emergency has been appointed by the National Security Resources Board. Like groups have been named for the stoker and gas equipment industries and initial meetings have been held at Washington. A joint meeting will be held in the future to correlate the whole.

The oilheating group consists of R. S. Bohn, chairman, A. T. Atwill, H. M. Brundage, Joseph Hearst, W. A. Matheson and R. M. Sherman with A. E. Hess of Oil Heat Institute acting as secretary. A three-man committee has been named to review industry orders and procedures, and a report and suggestions is due on April 1. The chief problem common to all branches of the heating industry, it has been agreed, is the prompt and complete conversion of all industries from normal, peacetime products in the event of a national emergency.

Catalytic Fuel Considerations

Performance Differences With Cracked or Straight Run Oil

by
B. R. Walsh*

IT SEEMS TO BE AGREED by manufacturers of oilburners, the oil industry and various national security departments and agencies that a concerted effort should be made by all parties to achieve most efficient possible use of fueloil and fueloil equipment.

While catalytic oils may at the present time offer some disadvantage when compared with straight run oil, they contain more Btu per gallon and the use of the catalytic cracking process permits a greater yield of fuel for oilburners than the use of thermal cracking alone.

Whereas straight thermal cracking makes products containing a relatively large portion of unsaturated olefinic hydrocarbons which are unstable or gum-forming, the catalytic process makes fewer olefins and more aromatics. The significance of this to the fueloil industry is that the cracked distillates produced by the catalytic process are much more stable to oxidation in the storage tank and therefore can be used as domestic heating fuel without any expensive re-treating. A discussion of the numerous factors involved in catalytic cracking such as regeneration, recycling, fixed-bed vs. moving-bed catalyst, boiling range of the charge stock, etc. is beyond the scope of this discussion. Suffice it to say that the advantages of the process make it indispensable for the production of essential war materials as well as peacetime products of superior quality. The valuable characteristic of catalytic cracking is that the gasoline produced has high antiknock value in the high-boiling portion, which is not true of straight run or thermally cracked gasoline. As a result, with the removal of the gasoline fraction from the catalytic cracked distillate, no No. 1 grade fuel remains, and the part which is used for No. 2 grade fuel is likely to have an A.S.T.M. 10%-point around 480°F. instead of below 440°F. as is desirable. Therefore, at present the practice of the oil industry is to supply domestic fueloil composed of a blend of catalytic cracked and virgin distillates which complies with the specifications for No. 2 grade fuel.

Fig. 1 shows the performance of a rotary wall flame burner on 100% straight run and 100% catalytic cracked fuel. This curve is obtained by tests of short duration in which the burner is operated on cycle and the air inlet changed in increments during each "off" period, readings of smoke density and CO_2 being taken during each "on" period.[1] It may be noted from this figure that smoke density decreases with increase of CO_2 for both fuels and that this particular burner is sensitive to change in fueloil type. Fig. 2 shows the performance of two typical conventional high pressure gun type burners (curves A and B) on

[1] FUELOIL & OIL HEAT, October, 1948, page 56.

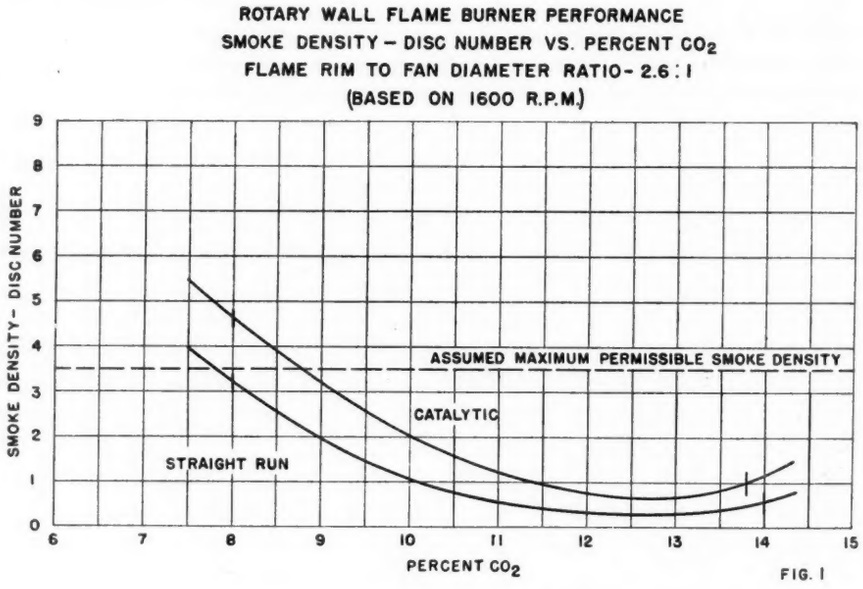

ROTARY WALL FLAME BURNER PERFORMANCE
SMOKE DENSITY – DISC NUMBER VS. PERCENT CO2
FLAME RIM TO FAN DIAMETER RATIO – 2.6 : 1
(BASED ON 1600 R.P.M.)
SMOKE DENSITY – DISC NUMBER
ASSUMED MAXIMUM PERMISSIBLE SMOKE DENSITY
CATALYTIC
STRAIGHT RUN
PERCENT CO2

FIG. 1

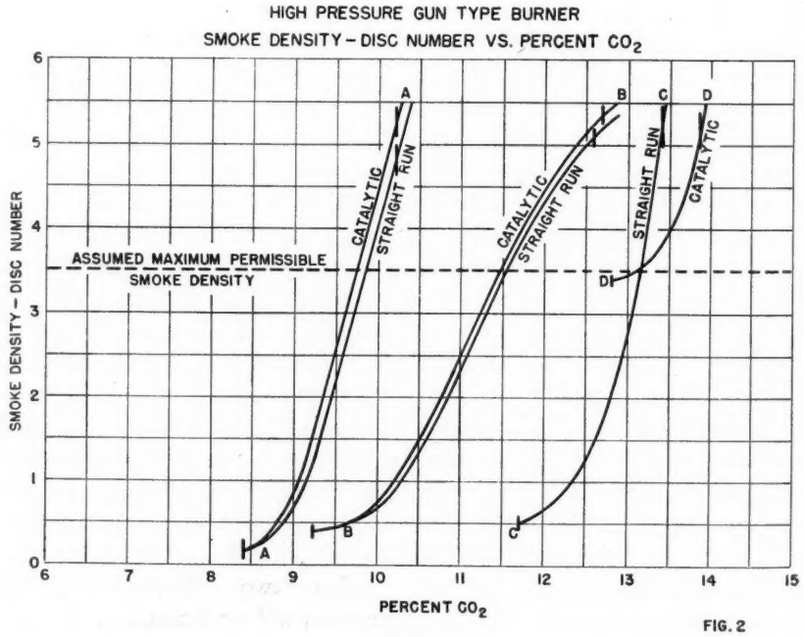


FIG. 2

*Section Engineer, Gulf Research & Development Co., Pittsburgh.

100% straight run and 100% catalytic cracked fuel. It may be seen that with these burners smoke density increases with increase of CO_2 and that these burners are insensitive to fueloil type, i.e. the curves practically coincide. The burner represented by curves A is a 1.5 gph burner having an eight bladed turbulator and a four bladed stabilizer. This burner is used with a 12 inch by 14 inch combustion chamber. The burner covered by curves B is of 2.0 gph capacity, has a four bladed turbulator and is used in a 15 inch by 24 inch combustion chamber.

The small vertical lines drawn through the curve define the CO_2 range for operation with no unburned oil in the flue gas and no starting difficulty. The CO_2 range for satisfactory burning behavior of the fuel in the particular burner is taken therefore as that portion of the horizontal scale falling between the vertical lines.

The smoke density referred to in the above tests is determined by use of a Shell smoke meter. Readings of CO_2 are determined by individual Orsat flue gas analyzers installed on each furnace and draft readings are taken by means of inclined draft gauges. Stack temperature readings are determined by an iron-constantan thermocouple installed in the flue. The sampling tubes for the flue gas analyzer and smoke meter, the thermocouple for stack temperature, and the inlet of the stack draft gauge are located in the stack in accordance with specifications given in U. S. Department of Commerce Commercial Standard CS-113-44. Sensitive check dampers are used in the stack to maintain constant draft settings. Flow rate is determined by use of a weigh scale and clock and the weight of fuel is converted to gallons according to the density of the fuel.

It has been determined that in order to establish the same CO_2 condition with catalytic fuel as compared with straight run fuel it is necessary that more air be provided by increasing the air inlet opening.

The readings of CO_2 taken on tests conducted on straight run and catalytic fuels in the conventional high pressure gun type burner referred to on curves B of Fig. 2 are plotted against area of air inlet opening on Fig. 3. It may be seen from this curve that for a given value of CO_2 the area of the air inlet opening must be increased approximately 20% for catalytic fuel over that used for straight run fuel, the fuel flow rate in gph remaining unchanged. The same condition was found to exist in the case of the high pressure gun type burner covered by curves A of Fig. 2. On a third gun type burner, however, it was found that the air inlet opening had to be increased approximately 100% for catalytic fuel to obtain the same value of CO_2 as existed with straight run fuel. The amount of increase in the area depends upon the characteristic performance curve of the blower for the restriction imposed. The first two burners were equipped with a 3 inch by 5 inch blower with little restriction to flow imposed by the air blast tubes whereas the third burner was equipped with a 3 inch by 6 inch blower with a rather high flow restriction. It is apparent that if the air inlet area is not increased a higher value of CO_2 will be obtained in the case of the catalytic fuel. However, curves B, Fig. 2 shows that increased smoke density will also occur, so that in order to maintain smoke density and CO_2 constant, more air must be provided in the case of the catalytic fuel. The relation of smoke density to air inlet area is shown on Fig. 4 for these same tests.

It is to be noted that even though the fuel flow rate were reduced with catalytic fuel from that used with straight run fuel in order to keep the Btu input the same, more air is still required by

HIGH PRESSURE GUN TYPE BURNER
PERCENT CO_2 VS AIR INLET OPENING – SQ.IN.

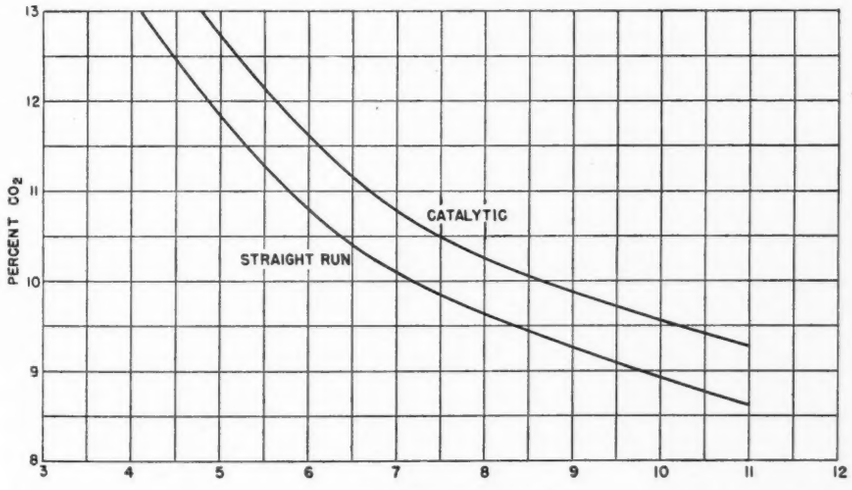


FIG. 3

HIGH PRESSURE GUN TYPE BURNER
SMOKE DENSITY – DISC NUMBER VS AIR INLET OPENING – SQ.IN

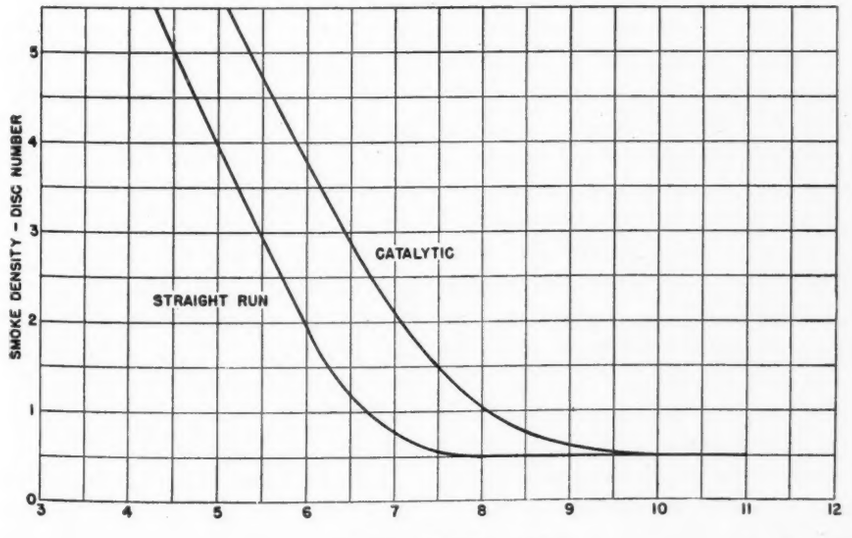


FIG. 4

catalytic cracked fuel because of its higher C-H ratio for operation at the same CO_2 value.

It is possible that a burner operating on the border-line between a passable and an unpassable condition with straight run fuel might give unsatisfactory performance on catalytic fuel, but if the burner were properly regulated for straight run fuel, catalytic fuel could be burned satisfactorily with only minor adjustment to the burner. For this reason various findings with reference to improving burner performance are enumerated. It has been said that combustion depends upon the factors of time, turbulence and temperature and the following examples verify this statement.

It was found that better combustion resulted when the desired flow rate was obtained in a high pressure gun burner through the use of a large orifice nozzle operated at low pressure (100 psi) than when a small orifice nozzle was operated at high pressure (150 psi), the spray angle of the nozzle being the same in both cases, Fig. 5. The interpretation of this is that the mixing of air and oil is improved with the large nozzle operated at low pressure because the velocity of the oil particles is lower relative to air velocity and more time is allowed for the mixing to take place in the mixing zone.

With reference to the second factor i.e. turbulence, Fig. 6 shows the performance of several types of turbulators purchased for use with a high pressure gun type burner. Curve A shows the burner performance with a straight air blast tube, no turbulator. The turbulator whose performance is shown by curve B consisted of two parts, one an eight bladed cone and the other a four bladed stabilizer. The cone is mounted at the end of the air blast tube and the stabilizer is placed four inches to the rear of the cone. These two items were opposed in pitch so as to reverse the motion of the air through the blast tube. Curve C covers another turbulator made in two parts. A cone having a restricted outlet with no blades is mounted at the end of the blast tube and an eight bladed swirler is installed inside this cone. Curve D shows the performance with a four bladed turbulator having the blades at an angle such as to impart a counter-clockwise motion to the air.

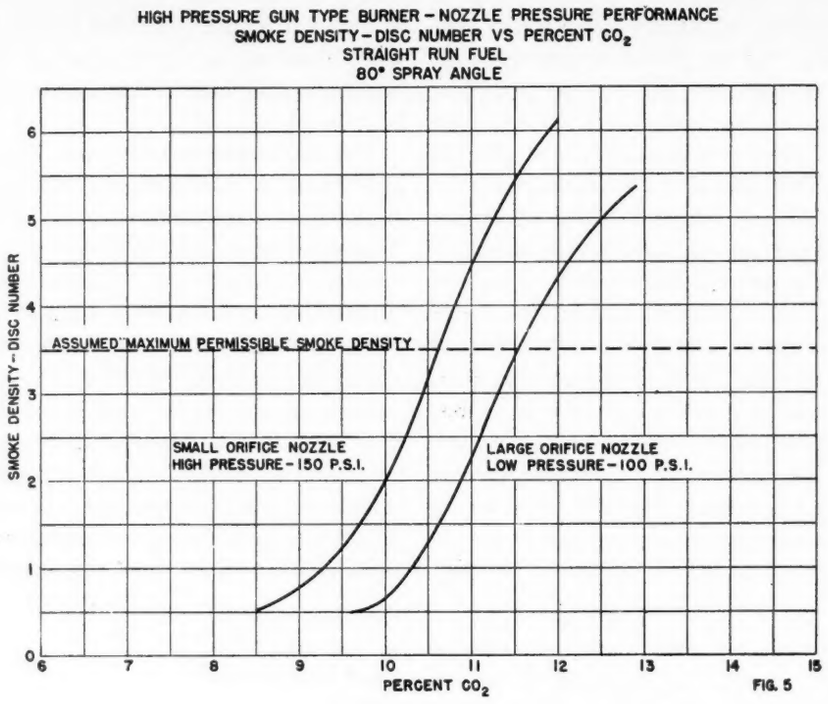

HIGH PRESSURE GUN TYPE BURNER - NOZZLE PRESSURE PERFORMANCE
SMOKE DENSITY - DISC NUMBER VS PERCENT CO_2
STRAIGHT RUN FUEL
80° SPRAY ANGLE
SMOKE DENSITY - DISC NUMBER
ASSUMED MAXIMUM PERMISSIBLE SMOKE DENSITY
SMALL ORIFICE NOZZLE
HIGH PRESSURE - 150 P.S.I.
LARGE ORIFICE NOZZLE
LOW PRESSURE - 100 P.S.I.
PERCENT CO_2

FIG. 5

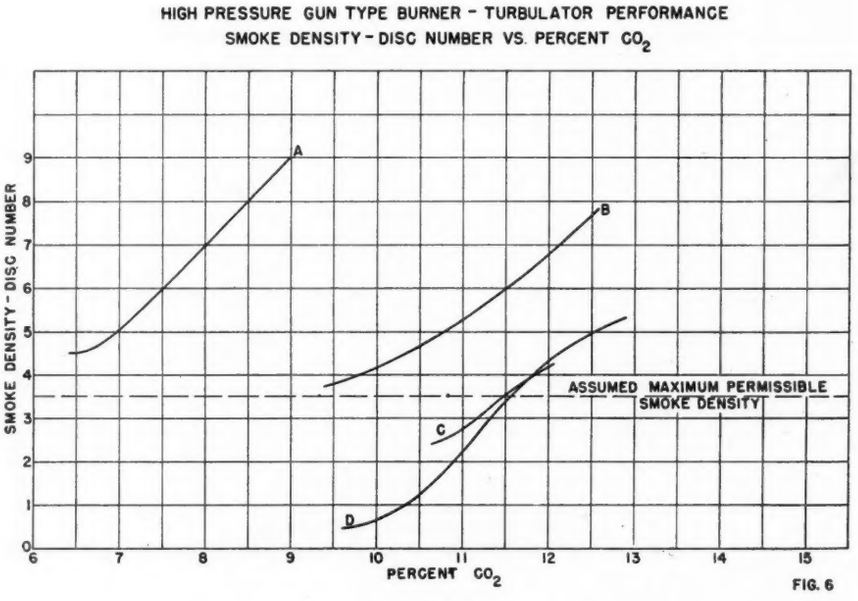


FIG. 6

It may be noted from the curve that best performance was secured with the simple four bladed cast iron turbulator installed in the end of the blast tube; it is apparent, however, that all three turbulators show definite improvement over the plain blast tube. Analysis of these curves indicates excessive restriction to the flow of air in the case of turbulator C and insufficient mixing action in the case of turbulator B.

The real problem involving the function of turbulence in oilburners would seem to be the maintenance of a flow of fresh air over each particle of oil so as to wash off the envelope of burned gases as fast as they form and provide a fresh supply of oxygen to continue the combustion until the droplet is entirely consumed. Different sizes of turbulators and different designs of oil nozzles are in general intended to produce this effect, but so far many of these turbulators merely produce additional resistance to flow of air through the blast tube. It may be concluded that a turbulator to be successful should provide a turbulent mixture of the air and oil without imposing excessive restriction to air flow.

Tests conducted in a rotary wall flame burner indicate that the fan diameter should be increased, especially for use

with catalytic cracked fuel in order to obtain better mixing of the air and oil. In this connection, it has been found that optimum performance is obtained with a flame rim diameter to fan diameter ratio of about 2.6 to 1.0 for fans rotating at 1600 rpm. This corresponds to a peripheral velocity of 3.0 fps per inch of flame rim diameter. Radial air velocity leaving the fan, relative to flame rim diameter, is the underlying basic factor.

Fig. 7 shows the smoke density obtained for various ratios of flame rim to fan diameter for a constant CO_2 value of 12%. These tests confirm the findings reported by Glendenning and Sullivan[2] regarding fan diameter in a rotary wall flame burner. It is not suggested that larger ratios be used because difficulty is likely to be experienced with ignition.

It is suggested that attention should be directed to the design of nozzle used in high pressure gun burners with a view to improving atomization and providing a form of spray which will facilitate mixing the air and oil. Tests have been conducted on an experimental target type nozzle in which the stream from the nozzle orifice impinges against a conical target positioned in line with the orifice by means of a supporting bridge fastened to the body of the nozzle. The tip of the target was provided with a small flat surface so that two separate sprays were created, one being almost perpendicular to the nozzle axis and of minor intensity, the other being the main conical spray. Under this condition, the air stream from the air blast tube was preheated by the small circular flame before coming in contact with the main conical flame and operation at higher CO_2 values was possible without excess smoke.

It is not necessarily recommended that a target type nozzle be adopted because of the interference in the spray cone due to the target support, but this information is given to show what might be accomplished by the use of a nozzle designed to provide two or more separate and distinct sprays. In these tests with the experimental nozzle the flame, instead of being orange with smoky tips was shorter and of a blue base with clean orange tips, a proof that mixing was improved.

In this connection several makes of burner nozzles have been calibrated and it has been found that quite a few of these nozzles have a rather wide variation both in capacity and spray angle from that stamped on the nozzle. Calibration of three makes of 80°, 1.75 gph nozzles at 100 psi pressure on 37 S.U.V. oil showed a variation from 1.5 to 1.72 gph, a maximum variation of 15%. The spray angles of those nozzles varied between 70° and 95°, a total variation of 35%. Two 45° nozzles of the same make were checked; one was found to measure 60° and the other 80°, a maximum variation of 78%. A check of the orifice diameters of these two nozzles on a comparator showed values of .012 in. and .016 in. respectively. FUELOIL & OIL HEAT for January, 1947 reports a case where a 3.5 gph nozzle, when measured at 100 psi pressure actually delivered 5.0 gph, an excess of 43%.

Flow tests conducted on several nozzles over a range of oil viscosity showed that the flow rate of the nozzle increased with increase of viscosity. The explanation is given that the nozzle incorporates a number of slots which impart a rapid swirl to the oil before it is discharged from the final orifice. This oil swirl increases when the oil viscosity decreases. It is nearly at right angle to the direction of nozzle discharge and is obtained at the expense of part of the pump pressure

(*Continued on page 126*)

ROTARY WALL FLAME BURNER - FAN PERFORMANCE
SMOKE DENSITY - DISC NUMBER VS FLAME RIM TO FAN DIAMETER RATIO
1600 R.P.M. MOTOR
CATALYTIC FUEL 12% CO_2

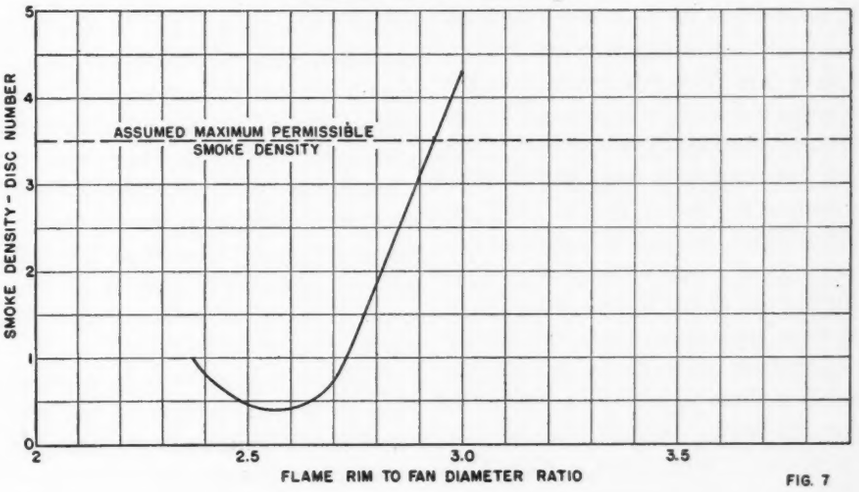


FIG. 7

SPACE TYPE HEATER PERFORMANCE
SMOKE DENSITY - DISC NUMBER VS. PERCENT CO_2

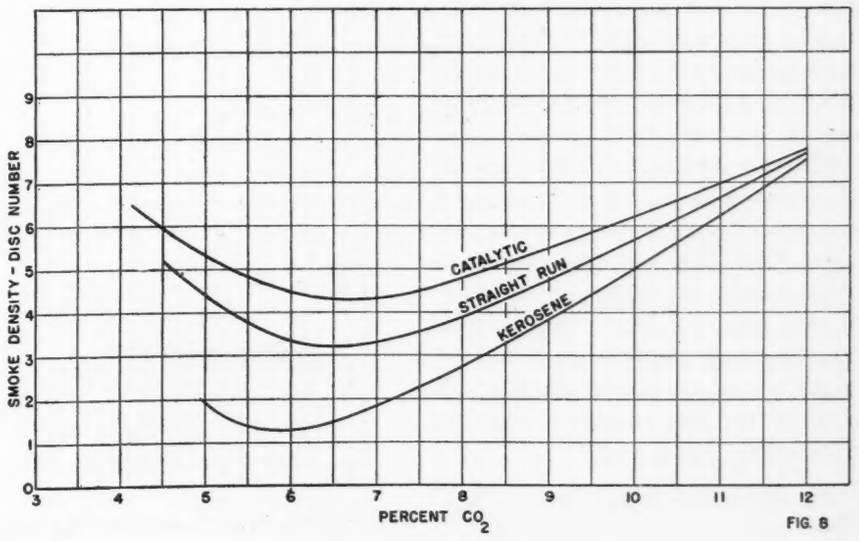


FIG. 8

[2] FUELOIL & OIL HEAT, September, 1945, page 39.

Vaporizing Pot Type Burners

Principles of Oil Gasification under Heat

By
Charles H. Burkhardt*

THE purpose of any oilburner, no matter what its design may be, is to prepare the liquid fuel for combustion. This is necessary because no liquid fuel will burn of itself. It must first be changed to a vapor or gas, and secondly it must be mixed with enough air to have the necessary amount of oxygen to enable it to burn cleanly and completely.

The methods used to achieve the breakdown of the oil into the vapor state are twofold. First, mechanical methods may be utilized and secondly, the thermal method (heat) may be applied. If mechanical methods are employed, they will be furthered by the application of heat. This means that no matter how fine we may break down oil by mechanical methods the heat of combustion will be necessary to complete the vaporization and burning process. Any employment of mechanical means to prepare oil for combustion implies the further use of the second method, that of heat application. However, the second method, that of aplying heat, may be used alone to prepare a liquid fuel for combustion without any previous mechanical preparation whatsoever. When such is the case, we have the true vaporizing burner.

To further apply this, we have but to look at the variously designed burners on the market today. The gun type burner achieves the first stage of preparation of the fuel by mechanical pressure atomization (high pressure gun type) or by the impact of a low pressure air stream on the oil within the enclosed confines of the nozzle (low pressure gun type). Both these methods result in a comparatively fine dispersion of the oil in the form of a spray. This spray is mixed with air and is finally converted to the true vapor state in which it will burn by the heat furnished from the combustion process itself.

So too with the horizontal rotary burner, which achieves the initial mechanical preparation of the liquid fuel by means of the centrifugal force created by the rapidly rotating cup. Once the oil in the form of a fine spray has left the cup, the process proceeds in the same manner as with the gun type burner.

It can be seen from the foregoing that in the preparation of the liquid fuel for combustion by mechanical burners, we have mechanical assistance in the form of pressure or rotation and physical assistance to finish the job in the form of the heat of combustion.

Upon analyzing the operation of the vaporizing pot type burner in preparing fuel for combustion, we find that the initial phase of mechanical preparation is eliminated completely and *heat alone* is relied upon as the means of getting the fuel to the vapor state. As a result, vaporizing pot type burners are essentially simpler in design and less complex in operation than are other types of burners that depend upon mechanical assistance as well as heat in the preparation of the fuel.

The fact that the vaporizing burner depends upon heat alone to gasify the fuel imposes limitations in regard to the fuel itself with the majority of vaporizing pot burner designs. However, when these limitations are properly understood and observed an extremely thorough type vaporization can be achieved which will result in clean trouble-free fires.

Since heat alone is being used to prepare the fuel and make it vaporize, it follows that the oil itself should be susceptible to vaporization upon the application of heat. It should always be remembered that the vaporizing pot burner unless specifically designed otherwise, depends upon the easy vaporization of the liquid fuel being used. Very simply put, this becomes a question of the fractions in the oil. Fueloils contain a number of light, medium and heavy fractions. The light fractions are highly volatile; that is, they change to a vapor very easily upon the application of a small amount of heat and burn readily. The middle fractions require more heat to prepare them for combustion and of course the heavier fractions require still more. Compare kerosene and Bunker C oils and the difference between a volatile light oil and an oil filled with heavy fractions is immediately evident. Usually the volatility of the oil is a function of the viscosity and the lower the viscosity the better is the oil for vaporizing burner use.

Once the lighter fractions begin to burn, as they will very readily, they furnish enough heat to vaporize the middle fractions which in turn furnish heat to vaporize the heavier final fractions. It is a progressive process, depending for its clean efficient start, upon the light,

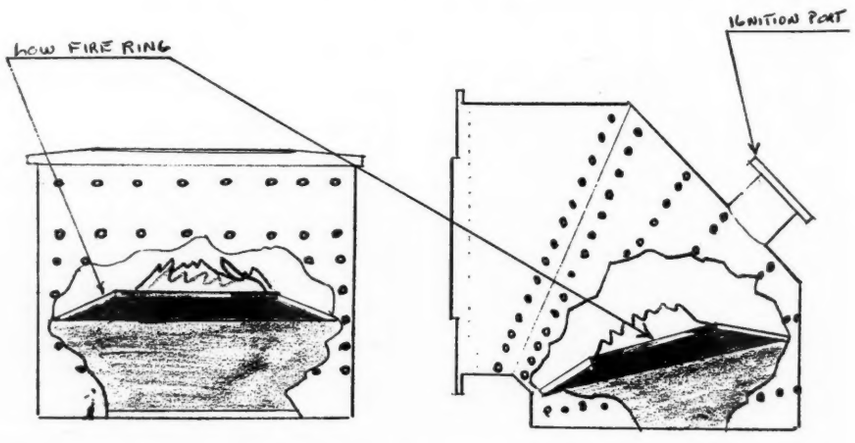


Illustration 1. *Natural draft vertical and horizontal firing basic type vaporizing pots.*

*Walter Hervey Junior College, New York City.

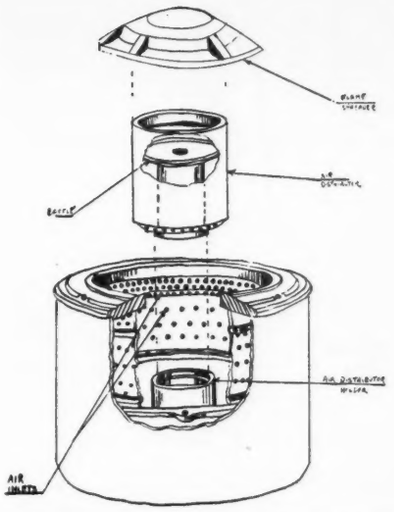


Illustration 2. *Vertical forced draft vaporizing pot equipped with baffle type flame spreader. Reading clockwise, beginning at the upper right, the labelled arrows read: Flame spreader, air distributor, air distributor holder, air inlets and baffle.*

easily vaporized fractions in the oil.

It should be observed from this that the average vaporizing burner designed for light oils should burn only those oils and not any higher number than that specified by the manufacturer as the top limit beyond which the burner will not perform efficiently. The majority of service troubles with vaporizing burners arise from ignoring this fact and not from any difficulties inherent in their design or operating principle. A vaporizing burner cannot be expected to perform efficiently if it is burning an oil for which it was not designed.

No one would expect the modern automobile with its internal combustion engine to run efficiently, if at all, on kerosene, and yet every day vaporizing burners are expected to run on fuels which in use are comparable to the utilization of kerosene in the automobile. It is interesting to note that in certain cases chronic, continual complaints about smoking and sooting of vaporizing burners are geographic or local in nature, while the same type burner in any quantity installation in another region will not show the same troublesome symptoms. This seems to be a pretty firm indication that the burners in the troublesome locality are being subjected to abuse in the form of oils heavier than that for which they are designed to burn.

This brings us now to the consideration of what happens during this vaporizing process. The application of heat to an oil can do two things. One is *to vaporize it* and the other is *to crack it.* When an oil cracks, it breaks up into other chemical compounds. With a straight-run distillate fueloil, this cracking process can be helpful, for such an oil when it does crack forms less complex compounds that *will vaporize at lower temperatures.* Thus, cracking and vaporizing occur through the heating process and the cracking actually facilitates the vaporizing process by creating chemical structures that vaporize at a lower temperature. This is true of straight-run distillates alone and does not apply to catalytic oils as we shall see later. Once the oil has vaporized and cracking is occurring there must be a sufficient amount of air present to furnish oxygen to the vapors. If there is not enough oxygen present, the oil will continue to crack until it has broken down into carbon and hydrogen. This carbon forms as soot and smoke, depending upon the quantity formed. Relatively small particles of carbon come out as smoke, larger particles settle out as soot.

Air Deficiency Problem

Observe that the vaporizing oil will not continue to crack until carbon in the form of soot and smoke is created *unless there is a deficiency of air.* The extent of cracking of a straight-run distillate oil also depends upon the temperature to which it is subjected and this critical temperature at which extensive cracking will occur can roughly be regarded as about 650° F. Thus if the oil is vaporized at temperatures not above 650° F. little extensive cracking will take place within the pot with its consequent risk of the formation of carbon. This means that whenever oil is heated where there may be a deficiency of air and the temperature goes above 650° F. smoke and soot will form because of the lack of oxygen. This is important in relation to the burner pot, for if portions of it are not washed by sufficient air then the temperature of the oil vapor in that portion must be kept below 650° F. or deposits of carbon will collect thereon as a result of cracking in an oxygen deficient atmosphere.

Thus the possible bad effects of cracking on a straight-run distillate can be controlled by keeping the vapors below 650° F. until enough air can be furnished to them at or above this temperature thereby preventing the cracking process from continuing until carbon and hydrogen, the ultimate components of the fueloil, are released in free form. It should be remembered, however, that cracking begins to take place upon the application of heat but it will not be a hazard to clean combustion until the aforementioned temperature levels are reached.

As the oil flows into the pot it receives the heat that will vaporize it from two sources. These are the pot walls themselves and the flame radiation. Most vaporizing burners depend upon the heat radiated from the flame to achieve thorough vaporization. This fact may result in trouble if the radiant energy from

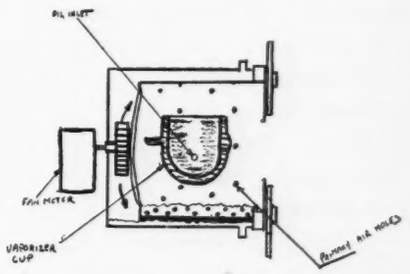


Illustration 3. *Forced draft horizontal type vaporizing pot. Note the internal vaporizing cup. Reading clockwise, beginning at the upper left, the labelled arrows read: Oil inlet, primary air holes, vaporizer cup and fan motor.*

the flame heats the oil at the bottom of the retort too rapidly.

The burner shown in illustration No. 4 is designed around the principle of keeping the temperature of the liquid oil below the point of its cracking out to carbon. The oil is heated slowly in progressive stages and only reaches the complete vaporization temperature in a region where sufficient air is introduced to prevent carbon formations. Failure to prevent such overheating will result in the oil reaching the critical cracking temperature at which it forms carbon before it has a chance to come into contact with enough air to prevent such a condition.

In such a case the heat radiated by the flame although it does vaporize the oil does so too quickly, and as a result

the air does not get enough time or opportunity to mingle with the vapors and prevent this cracking action. The oil, as we can see from this, must not be heated too quickly, a condition that may easily occur when a vaporizing burner is at the high fire stage. Laboratory experts advise the use of, and some manufacturers utilize, a metal shield or plate to provide cover for the pool of oil either at its source or over the total bottom area of the retort. This shield protects the oil from being heated too quickly as a result of the heat being radiated down upon the pot from the flame above. As a result of this shield type device, the fuel at its source is protected from the direct flame radiation and heats at a slower rate. This gives the rising vapors the time to mix with the primary air entering the pot. Once this has been done much of the danger from advanced cracking due to higher temperatures is effectively controlled and minimized.

As the vapors are formed, whether or not the vaporizing burner is of the forced or natural draft type, they will depend upon turbulence for their proper mixing with oil and air. As can be noted from illustration No. 1, there may be an inner ring or baffle part way down inside the pot, sometimes called the "low fire ring" because the flame rests on or within this ring at the low fire stage. This ring may also act as a shield preventing too rapid heating of the oil by flame radiation. Its main purpose, however, is to provide a narrowed opening for the oil vapors (arising from the bottom of the retort) to pass through. As a result of passing through this smaller opening, the vapors move faster, increasing in velocity, and as a result, when coming into contact with the air create a turbulent condition that results in a more thorough mixture. This is necessary if the oil is to be burned thoroughly. The turbulence created when the oil and air meet is a function of the velocity of either one of the two fluids.

The air utilized by vaporizing burners falls into three categories, those of primary, secondary and tertiary air. The primary air is that air introduced and mixed with the oil vapors prior to combustion. This primary air is furnished through the multiple inlet holes in the sleeve or inner perforated wall of the pot. It may be furnished through natural draft (illustrations Nos. 1 and 4) or by forced draft as shown in illustrations Nos. 2, 3 and 5. Sufficient quantities of this air being present they mingle with the vapors and prevent carboniferous cracking.

Secondary air is that additional air admitted through ports or slits at the top of the retort, which air enters the process of combustion immediately. This secondary stream of air furnishes the necessary oxygen for clean combustion just as the primary air streams furnish the necessary air for clean cracking.

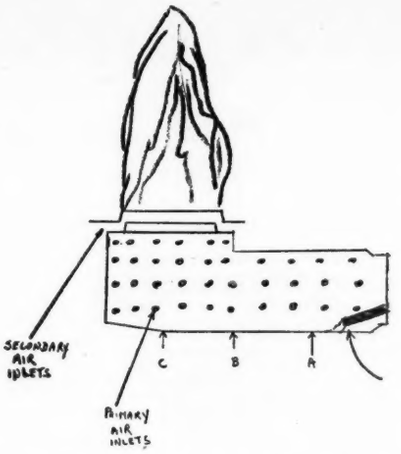


Illustration 4. *Natural draft vaporizing pot with increasingly progressive vaporization from A to B to C. Initial ignition and heating achieved electrically, while final vaporizing is accomplished by radiation and reflected heat from the flame.*

Some burners provide for a tertiary air opening. The horizontal pot types (illustration No. 3) avail themselves of this additional air impact. This stream supplies the air for the combustion that goes on in the combustion chamber entirely outside the pot opening. In such cases as this, the secondary air stream furnishes the air for such combustion as takes place within the confines of the pot housing and the function of the primary air remains the same.

Some vaporizing burner manufacturers eliminate the inner baffle ring entirely and achieve the turbulence by putting the air into the retort at comparatively high velocity. These streams of air mingle with the oil and rise around a metal air distributor (illustration No. 2) thus providing a hollow cylinder of air and oil rising through the pot. These in turn strike a baffle or flame spreader at the top of the pot and fan out and burn in a sunflower type flame. This type flame is characteristic of those vaporizing burners where this cylindrical projection and spreader extends above the top of the pot.

If no such arrangement within the center of the pot exists or the cylindrical distributor does not extend above the top of the pot, the flame will be conical or ball shaped and burn at high fire position at the top of the pot.

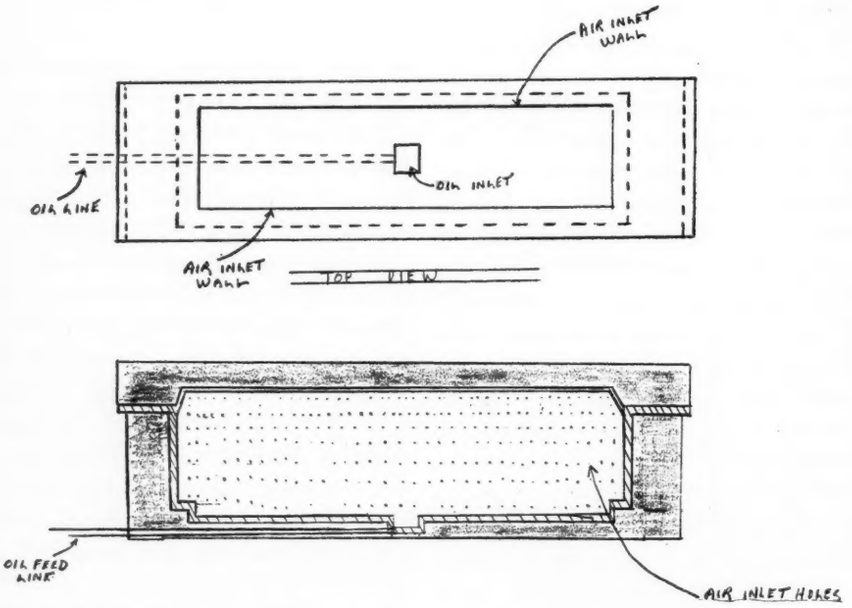


Illustration 5. *Top view (above) and sectional side view (below) of a typical rectangular vaporizing pot. The burner employs forced draft but the fan and air delivery parts are not shown.*

(Continued on page 124)

How to Figure Cfm

Furnace-Duct Systems Planned and Checked by Short-Cuts

by
J. W. Schulz

DO YOU NEED a quick, easy way to find out how many cfm are needed to heat a room in a typical home?

In planing furnace-duct systems, the big question relates to how much air must come from the warm-air supply registers. The same question arises when you use air-flow instruments to check the cfm output of supply registers. To plan new systems and to check the performance of systems already working, you've got to know how to get cfm numbers.

Figuring cfm's can be as easy as this. Multiply the Btu heat loss figure of a room by the factor .0125, and you learn the cfm needed to heat the room. As an example, a living room has a heat loss of 19,852 Btu per hour in accompanying Work Sheet #2, so you multiply 19,852 by .0125 and obtain 248 cfm as your answer.

You've got to know first, of course, the Btu heat loss figure for the room, as this tells how much heat the room needs.

The use of the factor .0125 in the above example depends on two variables. First, this factor was used because the design temperature for the furnace was selected as 160°. A different factor is used for a different furnace temperature. Second, the factor .0125 corresponds to air travel of about 20 ft. from the furnace bonnet to the particular supply register. As there's greater or lesser chilling of the warm air in supply ducts of considerably different lengths, different factors are used for supply ducts greatly different in length.

The two factors that govern the selection of the proper cfm factor are taken into account by using accompanying Table 2, which is engineered to simplify the figuring and checking of furnace-duct systems in small homes. Here's how to get acquainted with this table. Assume for the moment that you have selected a furnace bonnet temperature of 160° because this is suitable for many small homes and is conservative in that the furnace's high limit control can reasonably be set up to 175° or somewhat higher if a pinch develops. Next, judge the approximate air-flow distance from the furnace bonnet to the supply registers of the particular room. Use only the 160° column in Table 2 together with the distance column at the left, and select the proper cfm factor. Factor .0122 applies to supply ducts more nearly 10 ft. long than zero ft. or 20 ft. long. Factor .0125 matches ducts about 20 ft. long; .0127 matches 30 ft.; and so on.

Work Sheet #2 shows how to apply the Table 2 factors to heating a five-room house and is based also on 160° temperature for the air leaving the furnace.

Table 2 has columns for furnace bonnet temperatures as low as 140° and as high as 170°. Many engineers believe an equipment dealer cannot go far wrong in selecting either 150° or 160° as the supply air temperature at the furnace, or bonnet temperature, but recommend 150° where questions arise about playing safe. As you can quickly work out examples to demonstrate, planning on a lower furnace temperature produces a higher cfm figure for a given room. This leads to larger duct and register sizes than would be used for a higher furnace temperature. If as a result the air circulation turns out to be needlessly great, as judged with the system in actual operation, it can be reduced by closing partly the balancing dampers in the supply ducts or reducing the speed of the circulating blower.

The cfm values of a system already in use, but new to the expert doing the checking, often are calculated to permit comparing the calculated cfm values with cfm figures obtained with the help of an air-flow instrument, used at the supply registers. The idea is to figure the cfm required for the proper heating of each room, and to use the instrument to find out if the supply registers provide sufficient cfm. More and more of such numerical check-ups on performance are being made, because duct-type heating has the peculiar advantage of permitting them to be made easily and speedily. When you do such checking, lean towards 160° or 170° furnace bonnet temperature as you use Table 2 to ascertain the cfm suitable for heating a room. Depending on the higher air temperatures probably will improve your opinion of the system you are checking. The designer of the system may have aimed for high supply air temperatures, low rates of air circulation, and relatively low cfm rates from the registers. Use a thermometer to take air temperature readings when checking a system in op-

WORK SHEET #1 - Computation of Heat Losses

1-Data on room - corner rm. with 2 outside walls & cold ceiling
Average frame construction: use Factor 18; 1½ air change
North outside wall = 20 ft. long. East outside wall = 14 ft. long
Ceiling Hgt. = 9 ft. 4 windows 32"×56". Outside door 32" × 80"

2-Area & Volume Computations

a. Gross outside wall area = (20+14)×9 = 34×9	=	306 sq. ft.
b. Area outside door plus windows = 4(32"×56")+(32"×80") divide by 144	=	68 sq. ft.
c. Net outside wall area (a-b)		238 sq. ft.
d. Cold ceiling area = 20 × 14	=	280 sq. ft.
e. Volume of room = 280 × 9	=	2,520 cu. ft.

3- Computation of Btu Losses

	Heat Loss in Btu's per Hr.
a. Outside Wall Heat loss = Net Outside Wall Area, item 2-C × 18 = 238 × 18 =	4,284
b. Cold Ceiling Heat loss = 280 × 18	5,040
c. Outside Door & Window loss = 68×77	5,236
d. Air Change Loss, 1½ = 2520 × 2.1	5,292
Heat loss of Room, 70° temp. dif. in Btu/hr.	19,852

eration. Read and make note of the temperature of the air inside each supply register, in the furnace bonnet, and in the supply ducts close to the furnace.

Using these methods makes it quick and easy to figure the cfm values needed for proper house heating, yet to start out the Btu heat losses of the house must be figured, as was pointed out earlier. Heating engineers and old-timers at heating work will want to use their pet, everyday methods for figuring Btu heat losses, of course, and can apply to these the proper cfm factors obtained from accompanying Table 2. This will obtain the proper cfm values for a duct-register type of heating plant.

Table 1 and Work Sheet #1 cover the Shortcut Method for Figuring Btu Heat Losses, which has been time-tested now for 15 years. This method, recommended particularly to newcomers to heating work who want a fast, fairly accurate method for figuring Btu losses, was developed by the author, has been published many times, and is now being used by hundreds of equipment dealers. Table 1 gives all the instructions needed to use the method, but does not give the details of the development of the method, which were published earlier and which can be used for the sake of maximum accuracy.

In figuring the first item, the heat loss of the outside walls, you can consider probably nine out of ten frame, uninsulated homes as suitable for the use of the multiplying factor 18. Only for very exceptionally poor outside wall construc-

Table 1

Shortcut Rule for Figuring Heat Losses

1. Outside Walls — For uninsulated outside walls: Multiply the net outside wall area in square feet by 18 to obtain the heat loss in Btu's per hour of a typical outside wall. If the wall is exceptionally poor for heat-holding, add 20% to the result. Or, if the wall (though uninsulated) is especially good for heat-holding, deduct 20% from the result.

For thoroughly insulated outside walls: Multiply the net outside wall area by 18 as above for typical construction, then take 20% to 40% of this as the outside wall loss depending on the effectiveness of the particular insulation.

2. Cold Ceilings—Consider cold-ceiling area as outside wall area and use the factors given above.

3. Outside Doors and Windows—Multiply the sum-total opening area in square feet by 77 to obtain the heat loss in Btu's per hour of ordinary doors and single-glass windows. Use the factor 50, instead of 77, for double outside doors and doors fitted with storm doors, and for windows fitted with storm windows.

4. Air-Change or Infiltration — Multiply the volume of the room in cubic feet by 1.4 to figure, in Btu's per hour, the heat loss corresponding to one air change per hour. Figure one air change per hour for a typical room which has one outside wall. Figure one and one-half air changes per hour (multiply by the factor 2.1 instead of 1.4) for a typical room which has two outside walls; that is a corner room. Figure two air changes (use the factor 2.8, equal to twice 1.4) for typical rooms with three or four outside walls. "Typical" as used here refers to leakage-tightness and comparative window and outside door areas of same-size rooms. For rooms with unusually great areas of windows and outside doors, and into which outside air pours freely through window and door cracks, use judgment and compensate for the oversize air-change loss by adding 50% or 100% to the air-change loss as figured by the above instructions.

5. Total Heat Loss—Add the heat losses figured for the outside walls, cold ceilings, windows and outside doors, and air-change or infiltration. The sum is the estimated heat loss for the room in terms of Btu's per hour, inside temperature 70° and outside temperature zero. Add the heat losses of all the rooms to obtain the heat loss of the building.

If you desire to figure for a temperature difference of 60° instead of 70° (the temperature difference equals the room temperature, usually 70°, minus the outside temperature for which the heating plant is designed) multiply your results by 6/7. Or multiply by 5/7 to match 50° temperature difference, by 8/7 for 80° difference, and by 9/7 for 90° difference. Always use the temperature difference used regularly by the reputable heating contractors in the particular city.

Development of cfm factors for Table 2

Example: Find cfm of 150° air needed to heat room with heat loss of 10,000 Btu per hour

(A) $cfm = \frac{10{,}000 \text{ (Ht. Loss)}}{60 \times .24 \times \text{Density @ S.A. Temp.} \times (t_{S.A.} - t_{Room})}$

(B) $cfm = \frac{10{,}000}{60 \times .24 \times (t_{S.A.} - t_{Room})} \times$ Vol. in cu. ft. per lb. dry air @ S.A. temp.

Obtain this value from A.C. textbook

(C) $cfm = \frac{10{,}000}{60 \times .24 \times (150-70)} \times 15.35$

$\frac{153{,}500}{1152} = 133$ for 10,000 Ht. Ls.

Multiplying Loss by .0133 gives cfm

WORK SHEET #2

Computation of cfm needed to heat rooms

Room	Heat Loss	Supply Duct Length	*Factor from Table 2	Required cfm	Judgement cfm
Liv. Rm.	19,852	16½	.0125	248	
#1 Bed Rm.	14,230	13	.0122	174	
#2 Bed Rm.	10,378	21	.0125	130	
Din. Rm.	7,919	17	.0125	99	
Bath Rm.	2,106	28	.0127	27	
Kitchen	5,033	37	.0130	65	
Total	59,518		total	743 cfm	

* 160° Furnace Design Temp.

tion need you add the mentioned 20% to the outside wall loss, and only for exceedingly expensive, well-built outside walls need you deduct the mentioned 20%.

In taking outside-wall building insulation into account, by all means check with the manufacturer of the insulation to determine to what percentage the heat loss of the wall is reduced by the insulation. You can safely figure, however, that excellently applied rock wool insulation, which fills completely the space in a frame outside wall, reduces the heat loss to 20% of the ordinary loss figured by using the factor 18.

Item 2 in Table 1, cold ceilings, refers to the ceilings of rooms under unheated spaces. In a bungalow having no upstairs rooms, all the ceilings are cold ceilings. In a home of two stories without third floor attic rooms, the second floor rooms have cold ceilings.

Item 3 calls for the use of common sense, since the tightness and relative window areas, compared to those of normal rooms, must be judged by the man who surveys the house. The air-change loss of a sun room which has notably leaks but no storm windows may have to be taken, for example, as two to three times that of a typical living room with the same number of outside walls.

Work Sheet #1 gives the complete story of figuring the Btu heat loss of a room. All of the data obtained by examining the house or the house plans are in the first section. The second section is made up of simple arithmetic. The third section contains the application of the Shortcut Rule given in Table 1. In reviewing this work sheet, notice that the gross and net outside wall areas are listed separately. Gross outside wall area, obtained simply by multiplying the height of the wall times its length, contains the areas of the windows and doors in the wall. Deduct the window and door areas from the gross wall area, and you obtain the net wall area which is used in figuring the heat loss of the wall. The end product of Work Sheet #1 is the heat loss of the room, given as 19,852 Btu per hour for 70° temperature difference in the example. This figure is transferred to Work Sheet #2, which has been described.

The column "Judgment cfm," in Work Sheet #2, invites making allowances for important factors not covered by the heat loss computations. The designer of a system sometimes aims for exceptionally low fuel consumption by decreasing somewhat the amount of heat given the bedrooms, where he judges this will be suitable for the particular home owner, and increasing the cfm for the living room and dining room above the cfm calculated as required. Allowance can be made for the heat given off by an inside chimney. Experts often decrease the kitchen cfm, below the calculated value, to compensate for the heat given by cooking with gas, and gain special bathroom comfort through increasing considerably the cfm. Where there is danger of draft discomfort being caused by unusual hall or stairway arrangements, or by the return-air system to be used, cfm figures higher than those calculated for the affected rooms may be in order.

An accompanying box indicates the development of the cfm factors for Table 2. Line A gives the required cfm of a room as equal to the Btu heat loss over a denominator made up of a series of figures. In the denominator, 60 represents the number of minutes per hour, .24 is the specific heat of air (some authorities prefer to use the value .2375 instead of .24), density is in terms of pounds of dry air per cubic foot at the supply-air temperature, and the (t minus t) at the end stands for the supply-air temperature minus the room temperature, the room temperature being taken as 70°.

Line B alters this familiar formula, substituting air volume for air density. The air volume figure, in terms of cubic feet per pound dry air at the supply- air temperature, can be obtained from a textbook or handbook.

Line C inserts the proper values for air from the supply register at 150° and gives 133 as the cfm required for a heat loss of 10,000 Btu's per hour. From this comes the factor of .0133, given in Table 2 for 150° bonnet temperature and supply duct length equal to zero feet. Higher factors are needed, naturally, to compensate for cooler air coming from registers far from the furnace. Table 2 is based on a temperature loss of .2° F. per foot of duct between the furnace and the particular supply register. This temperature loss can be assumed only for ducts of typical design which are located in heated spaces. Take two steps for other supply ducts: (a) insulate effectively any supply ducts located in especially cool places, including spaces under a house and duct spaces in outside walls, and (b) allow for the ducts being cool when the furnace starts; in using Table 2, select a factor from a line somewhat lower than corresponds to the actual airflow length of the duct. To use Table 2 for an insulated duct 30 ft. long, located in a poorly heated space, for example, you might assume the duct is 60 ft. long when you select the cfm factor.

The judgment of the man doing the

(Continued on page 122)

Table 2

Factors for Figuring Cfm Needed in Each Room

Distance in feet from F. Bonnet to S. Register	Air Temperatures at Furnace Bonnet			
	170°	160°	150°	140°
0	.0110	.0120	.0133	.0150
10	.0112	.0122	.0136	.0155
20	.0114	.0125	.0139	.0161
30	.0116	.0127	.0143	.0166
40	.0118	.0130	.0146	.0172
50	.0120	.0132	.0149	.0177
60	.0122	.0135	.0153	.0183
70	.0125	.0138	.0156	.0189

The use of these factors compensates automatically for the drop in temperature of the air which travels to registers far from the furnace. These factors assume a 2° drop in air temperature for each 10 ft. of distance between the furnace bonnet and the supply register.

Multiply the Btu heat loss of each room by the proper factor, and you determine the cfm needed to heat the room.

Significant Service

Oilheating Dealers Discuss Service At Boston Convention Forum

AT THE ANNUAL meeting of the Oil Heat Institute of N. E. in Boston March 25, several prominent oilheating and fueloil officials from the Mid-Atlantic states outlined their present thinking on oilburner service. The panel discussion had been arranged by Fred Beckwith with the thought that burner service gains increasing significance as the oilheating industry swings back into a highly competitive operation.

Some four hundred members of the Association assembled in the Statler ballroom, heard the papers, then remained for a question and answer period that brought to light some interesting views of the individuals on several oilheating subjects. The members of the burner service panel were L. B. Fox, manager of the Fueloil Department, Socony-Vacuum Oil Co., N. Y., John R. Sherwood, president of Sherwood Bros., Baltimore, and H. M. Spade, manager of the oilheating division, Robison Oil Company, Hartsdale, N. Y. Robert Gray of FUEL-OIL & OIL HEAT was moderator, outlining briefly the thinking that resulted in planning the session, introducing the speakers, and conducting the question period at the close of the meeting.

The Fox paper, the service viewpoint of a major oil company follows:

Fox Urges Conservation Service

AN IMPROVED TYPE of oilburner service seems to be called for by the trends that we see today and which we expect will continue for some years to come. The necessity on the part of consumers for reducing their consumption of fueloil during the years of rationing focused their attention on the many ways of getting along on less oil. Later, the need for conserving fueloil supplies produced considerable publicity on ways to save which again impressed consumers with the possibilities of being comfortable on fewer gallons. Higher oil prices have added to the public's interest in the economical burning of oil.

This new interest by the consumer can either be used or mis-used by the oilheating industry. The interest can be allowed to degenerate into vocal dissatisfaction with oilburner servicing or it can be seized upon as a means to further strengthen our industry. How well we meet new competitive threats from natural gas or from mixtures of natural and manufactured gas or from heat captured from sun rays will depend considerably upon our ability to channel this interest in the right direction.

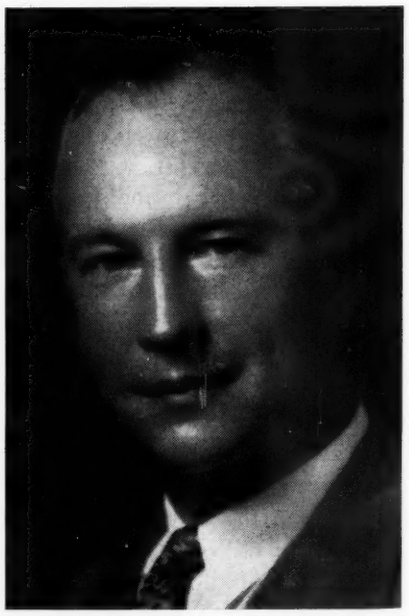
Every thoughtful person associated with the oilheating industry knows that service work has two categories: (A) the work of keeping burners in good mechanical condition so that they will produce heat when required and (B) the more difficult work of adjusting each burner so that it operates at the highest combustion efficiency which can be achieved within practical limitations. Generally speaking, the quality of service work under category A has been good. The possibility of a mechanical failure no longer is a factor that has a detrimental effect on the public's acceptance of oilheating. The same cannot be said for service work in category B.

Some of the larger manufacturers of oilburners have made surveys which show that many of the oilburners in use are operating at low combustion efficiency. The Oil-O-Matic survey in Champaign-Urbana, Illinois, last year is a typical example. We have made spot surveys, too. So we all know that the great majority of fueloil consumers are paying more to heat their homes than they should—simply because we as an industry have concentrated more on service that keeps burners running than on service that keeps them running efficiently.

Who is responsible for efficiency? Everybody has a segment of it, including the consumer, even though in the end it is the oilburner service man who must produce it. The oilburner manufacturer is responsible in two ways: his burners must be capable of producing high combustion efficiencies and he must have the programs for training dealers and service men which show them how to get out of each burner all the efficiency built into it.

The oil refiner's responsibility is two pronged also. In cooperation with burner manufacturers, he must produce an economical heating oil which will burn completely when used in the types and designs of burners on the market. And when the specifications of that oil are established, he must make supplies available that are uniform in quality. The combined job of the oil refiner and the burner manufacturer is to provide burner dealers and fueloil distributors with products which satisfy high standards of efficiency.

Given such products, it is of course up to the organizations who install and service burners to do this work in such a way that none of the efficiency built into burners and fueloil is wasted. This is the point at which we run into trouble, and we do so because it takes a good long



Fox

"DETROIT" *Controls* for Vaporizing Oil Furnaces

Automatic—Thermostat Controlled

Simple
Reliable
Durable

CRC-239 FF
With 2-Speed Draft Fan Control

CRC-239 FH
With Draft Fan Control, High Fire Only

CRC-239 FN
Without Draft Fan Control

The "Detroit" line of controls for vaporizing type oil furnaces is complete, thoroughly tested by years of service—simple, reliable and durable.

Typical of the operation of these valves is the CRC-239 FF. When the room thermostat calls for heat, the valve opens to a hesitation point, at which a predetermined amount of fuel is fed to the burner for approximately one minute. At the end of this hesitation period the metering stem snaps to the full "on" position and the motor speed is increased simultaneously to provide full draft for high fire operation. When the room thermostat is satisfied, the heat motor returns the metering stem to the hesitation point within a few seconds. The fan continues to run at high speed for approximately two minutes to clear up the fire. At the end of this purge period the oil flow is cut down to pilot and fan speed is reduced to provide proper draft for the pilot.

CRC-239 FH operates in the same way, except that the induced draft fan is cut off at low fire, for which natural draft is used.

CRC-239 FN is for use with burners not having induced draft, or for those burners having continuous forced draft at both high and low fire.

All models have independent adjustments for high and low fire. All are based upon the sturdy, reliable CRC-239 Float Valve mechanism. They're easy to clean, and rarely need any other servicing.

Use the "Detroit" No. 411 Thermostat with "Detroit" Furnace Valves, for the most satisfactory operation.

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"DETROIT"

"Detroit" Heating and Refrigeration Controls • Engine Safety Controls • Safety Float Valves and Oil Burner Accessories • "Detroit" Expansion Valves and Refrigeration Accessories • Stationary and Locomotive Lubricators

time for men to learn how to install and service for maximum efficiency. So many variables exist, other than burner design and oil quality. The caliber of men attracted to the industry is no better than average. Some old-timers in the service ranks resist the learning of new methods and techniques. The attitude of some dealers toward the service end of their businesses is not progressive. So it is difficult to translate efficiency objectives into actual results at the consumer level.

Every effort, though, should be exerted in that direction. The difficulties must be overcome if the oilheating industry is to stand up to its competition and continue to progress. And they can be overcome if we all work at it.

Proper Training Essential

We need to do two things: First, we must see that burner service men are properly trained in the methods of setting burners so that efficiencies will be at their practical maximums for the better part of a heating season. This means a more general reliance upon instruments for testing, for only by instruments can uniformly accurate results be obtained by service men of average skill. Smoke density tests in particular are of utmost importance today. As a matter of fact, instruments may be the key to the situation. Through their use, the training problem might not be so tremendous.

Secondly, the consumer should be informed that he too is partly responsible for the efficient operation of his burner. After all, the burner belongs to him. It is in his house. Nobody can legally enter his house without his permission. And he won't let service men come in or will he pay a fair price for service until he understands the value of their work to him.

I know that all reputable burner manufacturers carry on dealer training programs religiously. I know that more and more trade schools are turning out more and more men fitted to service burners. If these programs and courses put proper emphasis on the methods that can be used to adjust burners for maximum long-term efficiency, then they are really making a contribution. I know also that manufacturers of instruments have by now designed the required testing tools. So the industry is moving in the right direction as far as this work is concerned. However, I do not believe the industry is progressing fast enough along this road or on a broad enough front to satisfy the public.

In addition, to my knowledge, very little is being done yet to impress the consumer with his responsibility in the matter. In fact, much has happened in the past to spread the impression that he has no responsibility. When he was sold a burner, he was told that he was buying automatic heating—all his heating worries would be over. "Install it and forget it" was the theme. This comfortable attitude was further encouraged by the relatively low price of fueloil for many years. A 10% annual saving was so little that most consumers could ignore it. This impression of the consumer that he can pay no attention to efficiency must be changed, not only for the good of present consumers but for the greater health of the oilheating industry in the future.

The automobile industry is stronger today than it otherwise would be only because most owners of cars recognize the imperative need for adequate servicing. It took many years and millions of dollars to convince people that car ownership involves expenditures for periodic changes of crank case oil, frequent lubrication, and regular motor tune-ups and adjustments. The same type of service is just as important in an oilburner, but most consumers do not realize it yet. They have to be told, particularly now that fueloil is no longer a relatively inexpensive by-product.

The problems I've mentioned are not the sole responsibility of equipment manufacturers. We in the oil business are involved too. You all know that the normal demand for petroleum products is pressing quite heavily against the supply that can be made available. We may never again enjoy, year after year, the comfortable surplus in productive capacity which we enjoyed before the war. So we have a keen interest in the economical use of our products. We cannot sit back and see our products wasted in large quantities. We can't invest millions of dollars in facilities to produce extra gallons of a natural and irreplaceable resource so that these gallons can be wasted. We want to follow our product into the basements of this country to be sure that every gallon does useful work.

Cooperative Research

We can't do the whole job but we can and are cooperating with manufacturers of burners and instruments in research work. We're going even further. We're providing better and better training in burner service work to our own resellers and their service men. We have both preliminary and advanced courses, plus a quarterly magazine which devotes quite a bit of space to the problems of servicing. And this year we have issued a consumer booklet which we hope will make the consumer more conscious of the importance to him of efficiency check-ups. This booklet is entitled "How to be Friends with your Oilburner." In it we say, "Some years ago, uninterrupted operation of the oilburner was all the homeowner asked. He just wanted to be sure that the thing would keep running all winter long.

"Today, however, every thoughtful consumer of fueloil wants more than trouble-free operation. He wants efficiency of operation that leads directly to economy.

"That's why more and more people are giving the few minutes of thought each year that are needed to provide their burners with the preventive care that saves money."

If through this booklet and those of others, we can arouse the interest of the consumer in greater efficiency, and if we can train servicemen to be expert in efficiency adjustments, then this industry need have no fears of competition from any of the other house heating fuels generally available today or in the immediate future.

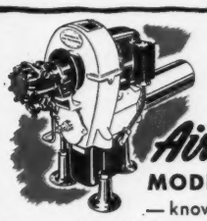
Sherwood On Management

SINCE I have been assigned no particular subject within the broad field of "Oilburner Service," I think the best I can do is to tell you about the attitudes, ideas, and activities of our own company on oilburner service.

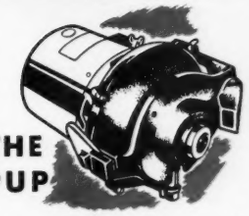
We consider ourselves as fundamentally in the Oilheating Business, not just

A SOLID FOUNDATION

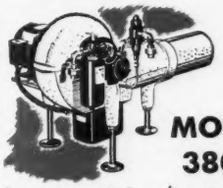
for your business



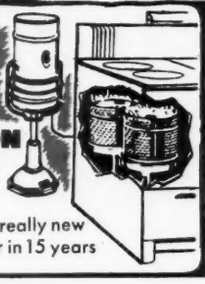
Air Seel MODEL 800
—known to millions as "the oil burner that conserves the heat it makes"



THE PUP
—for restaurants, baking ovens, etc.

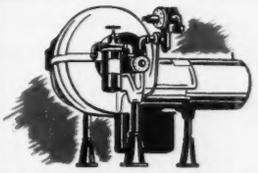


MODEL 3800
—for commercial application such as banks, stores, churches, etc.



HUDSON BAY
— the only really new range burner in 15 years

Boiler Burner Unit
— the last word in a complete heating unit



MODEL 8800—for those big jobs—schools, factories, hotels that require capacities up to 30 g.p.h.

Dealers Who Know Choose

SILENT GLOW OIL BURNERS

25 years of experience in building oil burners has given Silent Glow a name millions know and trust.

Silent Glow Oil Burner Corp.
Hartford 6, Conn.

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Gentlemen:
Let me have the facts at once about a Silent Glow dealership.

Name_____

Address_____

City_____ Zone____ State_____

Your opportunities are greatest when you feature a proven product. A Silent Glow franchise may still be available in your community. Contact us at once for complete details.

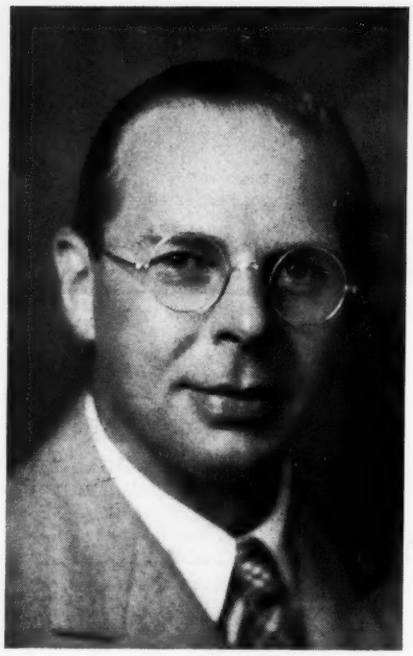
fueloil, not just burners, not just service. Our job is to furnish packaged automatic oilheat to our customers under united responsibility. In so doing we have found it necessary to sell fueloil, sell oilburners, and render full and complete service on those burners, also additional sales and service on heating plants, summer-winter hot water installations, circulators, and that sort of thing.

It is necessary from time to time to install new boilers and to do a certain amount of heating work, although we make no effort to secure heating work as such; and in most cases where heating work is involved we direct the customer to heating men whom we know, and who we know will give the customer a good job at a fair price.

Oilburner service is, of course, a very important element in oilheating. Oilburners are mechanical devices and are subject to the ills and ailments which affect all mechanical devices. However, we consider oilburner service as something of a necessary evil. We would hope, some day, to make such perfect installations of such perfect equipment as would never require service, but that is as yet impossible. We have service thrust upon us, as it is thrust upon the customer. We don't like it, but we have to do it. Our basic philosophy and attitude toward burner service is an outgrowth of the situation I have just stated. Therefore we have tried to design our service and our service charges so that we can render a top quality service at minimum costs to the customer, resulting, as near as we can work it out, in a break-even cost to us. We have never achieved a break-even as yet, but we think we will this year.

In calculating our costs of rendering service we take in all labor, material, transportation, and overhead up to and including our service manager. This includes the cost of handling customer calls on the telephones, the necessary accounting and clerical work, dispatching and field supervision.

I think most of you know that for many years Baltimore was traditionally a free service area. I will still pay tribute to that period when the trade rendered free service on burners, because it was during that period that oilheat became well and solidly entrenched in the Baltimore area, resulting today in what we



Sherwood

understand from surveys to be one of the best oilheating communities in the country. However, during and after the war with rising costs it was impossible to take away from fueloil margins an amount of money sufficient to cover the cost of free service. Paid service then came into effect and is generally recognized today as a sound and proper means of handling service with the customer.

As perhaps a carry-over from the free service practice, the dealers in Baltimore generally follow about the same philosophy we have, namely, the objective of rendering service to the people at a minimum cost, even to the point of rendering service at something of a financial loss, subsidized out of the fueloil gross or from burner sales profits.

In spite of relatively low service charges in our area, the industry generally renders a good quality of service, realizing that if good service is not rendered then faith in, and acceptance of, oilheat will be depreciated. We all realize the necessity of maintaining a high reputation for oilheat, resulting in continued good will toward us on the part of the public.

Gas competition in our area is ever present and it is being talked around that natural gas one of these days will be brought into our community, resulting perhaps in lower costs on gas and that, in turn, will increase competition from the only other automatic heating industry. Service, therefore, should not be priced at a point where it appears really burdensome to the public, nor do we want the public to feel that we are making a profit at their expense on oilburner service, realizing that it is, after all, a necessary evil, and not for profit making.

After analyzing our service costs for 1948 very carefully, our company reached the conclusion that it would be necessary for us to raise prices this year in order to break even. Last year we lost a fairly substantial amount of money in rendering service. For your information, our scale last year was:

Our per-call rate was $3.50 for the first hour, plus $1.75 for each additional half hour.

The annual overhaul was $7.50.

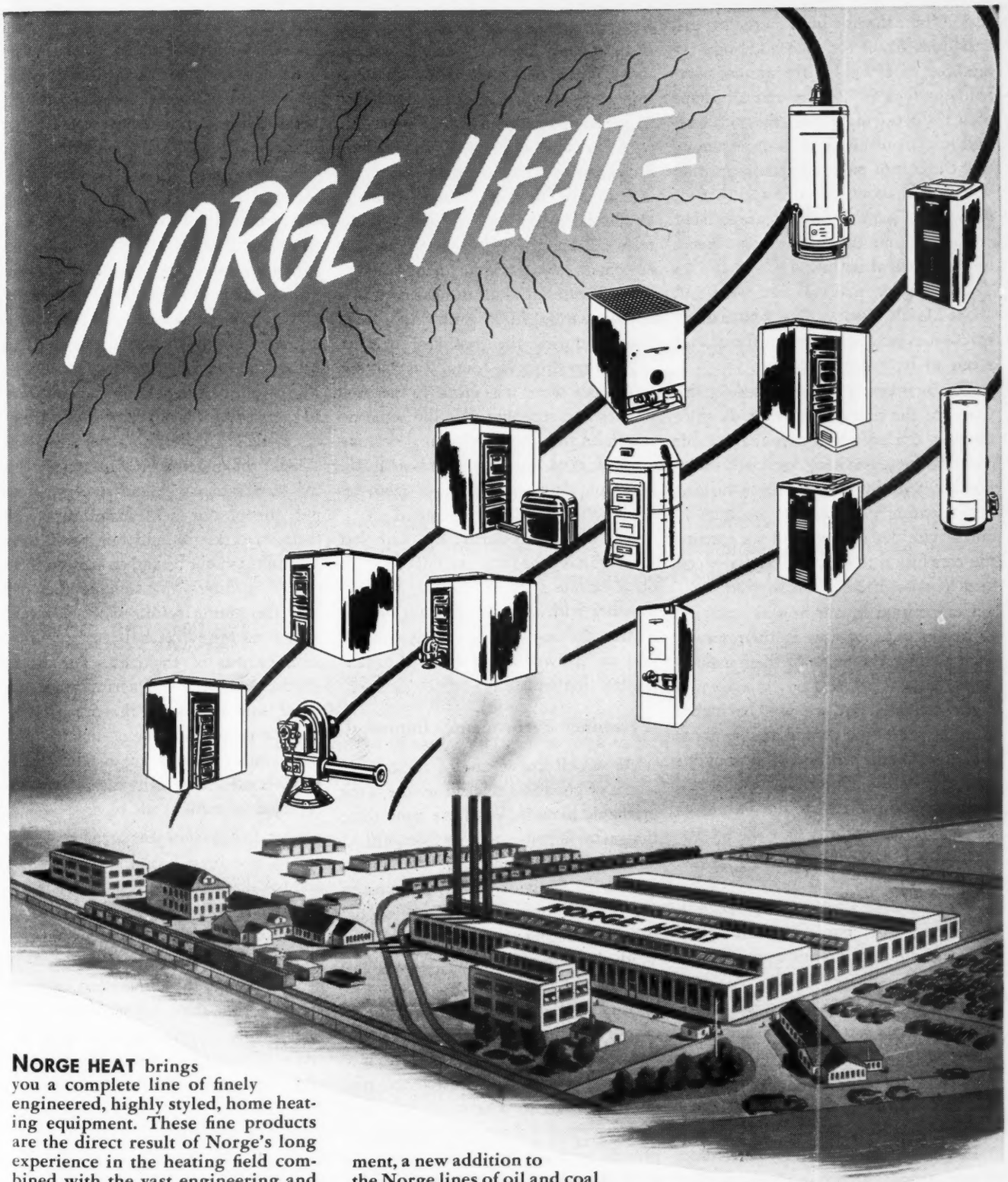
The all-in-one agreement was $15.00.

The annual overhaul as rendered by us includes thoroughly cleaning the boiler or furnace, brushing the surfaces and vacuum cleaning. We clean the chimney heel if needed. The burner is cleaned and lubricated, nozzle cleaned, and strainers cleaned. Controls are checked. A test is made of the fueloil tank to see whether any dirt or sediment has accumulated. Then the burner is adjusted to its maximum efficiency, in which operation we use the Orsat CO_2 instruments, draft gauges, and stack thermometers. After this operation a tag is placed on the installation giving CO_2 and stack temperature, date of the overhaul, and name of the mechanic.

Note that we use the term Annual Overhaul instead of Summer Overhaul. We do the bulk of these jobs in the summer but some are spread over the entire year, enabling us to keep our mechanics occupied all the time.

In our all-in-one service agreement we include the annual overhaul as just indicated, plus all necessary emergency service calls, and all necessary parts required for the period of one year, and we try, not always successfully, to limit this service to the oilburner itself, the combustion chamber, and controls. We do not include the oil storage tanks, or parts of the heating plant itself. Nor do we include the summer hot water hook-up, even though we might have sold and installed that equipment ourselves. We do, however, lubricate the circulator as part of our overhaul. For various reasons our desire is to sell the all-in-one plan.

This year we have raised our prices



NORGE HEAT brings you a complete line of finely engineered, highly styled, home heating equipment. These fine products are the direct result of Norge's long experience in the heating field combined with the vast engineering and production resources of the Borg-Warner organization.

This unique combination of two great names is your assurance of continued product quality . . . quality that has already found a wide acceptance.

Furthermore, Norge Heat is continuing to improve and expand their lines. Automatic gas heating equipment, a new addition to the Norge lines of oil and coal heating units, will soon be available. New plant facilities have been acquired in Kalamazoo, Michigan and in Elwood City, Pennsylvania . . . and plans are well under way to get them into production.

Complete information is available upon request to all interested dealers and distributors.

Norge Heat

Norge Heat Division • Borg-Warner Corporation • Detroit 26, Michigan

COUPON [FOH-1]

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NORGE HEAT DIVISION

672 E. WOODBRIDGE • DETROIT 26, MICHIGAN

fueloil / oil heat

to $4.00 for the first hour on the per call basis plus $1.00 for each additional 15 minutes; to $9.00 for the annual overhaul; and to $17.50 for the all-in-one plan. We calculate that these charges will just about break us even, assuming that the cost of parts and transportation will remain about the same and that we might have some slight increase in labor costs when our union agreement comes up for renewal in July.

Our service mailing just went out about March 12 so we do not have much reaction as yet but at present the change seems to have been accepted.

The increases in prices for service this year are the first we have made since the war, during which period all of our contributing costs have increased. During that period we lost money in varying but apparently increasing amounts in our service department and we reached the conclusion that it was finally necessary to raise prices to break even.

Competition in our area is scattered as to making increases in their service charges this year, some of them making no increase at all, and others making a slight increase, but we will be higher than the rest of our competition as far as we know. On the other hand, most of our competitors do not render the actual efficiency adjustment of the burner as we do. In other words they do not scientifically use the Orsat, draft gauge, and stack thermometers.

We have done a great deal of research during the past couple of years to try to determine just what was creating the necessity for service.

Last year, after deducting the installations still on warranty, we had 59% of our customers signed up on the overall agreement, 18% took the annual overhaul alone, and 23% remained on a per-call basis.

In view of the fairly high percentage of our customers on our all-in-one plan it is desirable for us to render as few service calls as possible. This is of benefit to the customer, as well as to us. Hence our research was aimed at finding out those things that caused service calls and how to correct them. One of the important items, for instance, is strainers and nozzles. Dirt, and sediment will creep into the oil system, regardless of how much care is taken to keep it out. It is a leading cause of repeat calls. Therefore, we adopted an annual procedure of thoroughly cleaning our bulk storage tanks. Then we set up a close cooperation with the organization rendering tank cleaning service in our area, and where we discover a dirty condition in a customer's tank we direct this to the attention of the tank cleaning company and usually they get the job and the tank is cleaned. We also circularized our customers who had the older installations. The result of all this has been that approximately 2,000 tanks have been cleaned during the past year or two.

Another thing we found was that our mechanics were not properly cleaning nozzles and strainers. We did some research on this and developed a cleaning method. As a result the number of call-backs on nozzle and strainer cases has been very considerably reduced.

We discovered during last year that we were having a large amount of service on a certain type of control. We got together with the manufacturer on this matter, the case was thoroughly studied, and we are well along the road to correcting that situation.

Personnel Performance Improved

As we all know, one of the cornerstones of good and efficient service is the mechanic himself. We have done three things to improve the performance of our personnel—One, we revolutionized our hiring methods; two, we improved our training system; and, three, we developed a rating or grading procedure. With the help of an industrial relations psychologist, we developed a series of aptitude tests for our men. We put all of our existing men through this test and our personnel department gives it to all new persons who wish to come into our organization. The result has been that we have taken on only men of proven aptitude, and this scheme has worked out very well indeed. As part of our personnel program we also developed and put into effect about 15 months ago a grading or scoring system. It is fairly elaborate but not too difficult to operate, and it has done wonders in improving the efficiency of the men; so much so that this time a year ago we were servicing 422 installations per mechanic, and today we are servicing 564 installations per mechanic.

This scheme of rating and evaluating the men was worked out by us, then taken up with the union officials, who were most cooperative, and everyone is now in agreement that it is a good thing, both for the men and for the company. The method produces a single figure at the end of each month which measures the total efficiency of the men. Each man is given a report at the end of each month indicating his rating and also indicating the average for the entire group. Men who are above average are given a pat on the back, and men below average are given the opposite. This brings the men in, which we encourage. We do our best to help the men improve in every way. It is now part of our training system. The very low men are given a little shaking up in conference with the service manager and sometimes we put one of our field supervisors with them in order to find out what their difficulties might be and straighten them out. It is interesting to note that our aptitude testing results work out very well as measured by the actual performance records of the men. The whole scheme has improved performance, interest, and morale in the organization and the men really like it. Incidentally, the monthly reports are mailed to the man's home and in many cases his family takes an interest in his record.

Our Installation Department is operated as a branch of the total service and installation organization. We try to keep the installation men strictly on installations, and the servicemen strictly on service and annual overhauls. We, of course, give the installation men the same aptitude tests, but we do not keep as elaborate records on their performances because it is so much easier to observe their work and to determine the time they take to do a certain job. In our organization it is a promotion for a man to move from the Installation Department to the Service Department.

As I have said, we have two primary objectives in trying to constantly improve the quality of our service and the efficiency with which it is rendered. The better our service is, the more acceptable is our oilheat to the public; and the more efficiently we operate the less cost it is to us, and, operating under a philosophy of breaking even, eventually improvement would result in either a lowered cost to the customer, or lack of

NATIONAL OIL HEAT EXPOSITION

MECHANICS' HALL • BOSTON • MAY 16 THRU 20, 1949

IN CONJUNCTION WITH 26TH ANNUAL CONVENTION OF OIL-HEAT INSTITUTE OF AMERICA

THE NEED

Today—this year—the Oil Heating Business is on the rebound. But it's a buyer's market. It's going to take old-fashioned salesmanship with modern push, and that means *hustle* and *salesmen, advertising* and *visual promotion*. . . . Someone's going to get the business—the growing business. That someone is the Manufacturer, his Distributor, his Dealers who recognize THE NEED FOR 1949 METHODS TO MEET 1949 CONDITIONS.

THE OPPORTUNITY

1 To further your planning of a Positive Sales Program at the Oil Heating Industry's Event of the Year.

2 To bring **your** Positive Sales Program into step with the Leaders.

3 To show your complete line to Distributors, Dealers, and their prospective customers —the public.

4 To see striking exhibits of commercial-industrial equipment; space heaters, and domestic power units.

5 To benefit by hearing at Convention Sessions authoritative speakers in frank discussions of the Industry's problems.

6 To get the feel of a Prime Market—New England—and of the Entire National Oil Heating Picture.

THE OPPORTUNITY OCCURS, IN BOSTON AT THE 5-DAY NATIONAL OIL HEAT EXPOSITION AND OHI CONVENTION—THE OIL HEATING EVENT OF THE YEAR

See You There!

Make your Hotel Reservations *NOW* by writing Boston Chamber of Commerce, Housing Bureau, 80 Federal Street, Boston 10.

For Information on Exposition Space and Annual Convention write Oil-Heat Institute of America, Inc., 6 East 39th Street, New York 16

"OIL HEAT—PROVED AND APPROVED BY MILLIONS"

fueloil & oil heat

necessity to increase the cost.

As we see it, the price of improved quality and efficiency in service is eternal vigilance and constant attention to details, plus a continuing curiosity expressed in terms of constant research and a desire to find new and better methods.

I am willing to say here that I am well pleased with the accomplishments of our service organization under the capable direction of the manager of our Oilheating Division, my good friend Tom Carson.

I will never be satisfied that we have made all the progress possible but I believe we now have instruments to measure what we are doing and to set facts before us, and from that information we can better chart our course for future progress.

Spade

Spade's New Service Plan

TWO YEARS AGO NEXT month we decided that the burner service problem had been in our hair long enough and that there just had to be a better way to handle it than any we had tried before. Leaving out a lot of details, we boiled everything down to a few obvious and simple conclusions, namely—we serviced oilburners for only one reason, to have satisfied fueloil customers—we knew that oilburners, boilers and other oilheating equipment had to have a certain minimum amount of service if our customers were to enjoy all the economy, comfort, convenience and cleanliness of oilheat—that these services had to be rendered whether we liked it or not and at an attractive price—and finally, that they had to be offered or merchandised in such a way that our customers would take them.

From previous experience we felt certain that we could render the services to everyone's satisfaction, but one of the big problems was the average customer's attitude toward maintenance or prevention service. They seem to react to it about the same as they would to an invitation for a nice long pleasure ride in an elevator. Elevator rides and burner service were all right when they had to have them but too many people were just plain "not interested." We had always been quite successful in getting a high percentage of boiler clean and summer overhaul jobs so the only unfinished business was to find some way to include periodic inspections, emergency service and parts. At that time, the spring of 1947, we were charging $12.50 for a boiler clean and burner overhaul, and again from experience we knew it was not too difficult to pry our customers loose from $10.00 or $12.00 at one time but the difficulty of getting more than this amount increased just about proportionately as the number of dollars went up. The answer was very simple; why not collect the additional money in small amounts over the heating season so that it would be less painful?

Some kind of service contract on this basis was the only answer and we decided to include all the normal service requirements that anyone would need. After a lot of arithmetic we came out in May of 1947 with the following offer to all fueloil customers except those with special type or obsolete burners:

1. Wire brush and vacuum clean boiler, flue pipe and base of chimney if accessible.
2. Summer overhaul on burner and controls.
3. Labor for periodic inspections (every 3 to 4 months), repairs and emergency service on burners and controls, inspection service only on other heating unit mechanisms.
4. All available repaired or replacement oilburner and control parts found necessary to maintain the burner for efficient operation.
5. It did not include service, repair or replacement of parts due to flooded cellars or other abnormal causes. On parts coverage we excluded thermostat timing devices, combustion chambers, hearths, oil tanks and anything not part of an oilburner and its controls.

On air-conditioning and forced feed hot water heating systems we included lubrication, cleaning and adjustment of blowers, circulators, etc., with the overhaul job and also, when necessary, when inspections were made. As mentioned, parts failures due to water or other abnormal causes, emergency calls and repairs to blowers, circulators, etc., were charged at regular service rates. Our price for this complete protection or insurance coverage was $10.00 per burner plus ½¢ per gallon added to the price of fueloil with each oil delivery.

I know that some of our friendly competitors felt sorry for us—they said so—and to be truthful, we were banking pretty heavily on some uncertain economies which we thought could be effected in rendering service particularly if enough customers took contracts. We did not push the plan the first year, but 946 customers signed up. This was approximately 36% of all our oil customers and about 40% of the total of all the burners we would have accepted. Nearly 50 customers with special and obsolete burners sent in contracts which we had to turn down.

The results at the end of the first 12 months were not disappointing. The income from ½¢ per gallon was $11,818.00. The initial charges of $10.00 each totaled $9,465.00 making the total income $21,283.00. Out of this amount we spent $8,737.00 for direct labor expense for everything, boiler cleans, overhauls, inspections, emergency services, etc. Parts at our cost amounted to $4,529.00 making total expenses $13,266.00 which left a gross profit of $8,017.00 or 37 7/10%. This figure does not include any indirect expenses such as truck operation, dispatching, unproductive labor time, telephone, stock room and administrative expenses or any items of overhead.

During this time our income on "call"

GREATEST OIL HEATING IMPROVEMENT IN YEARS

SUN-RAY'S UNIQUE BURNER DESIGN PLUS SHELL DEVELOPED COMBUSTION HEAD IN SERIES "S" BURNERS ASSURE PEAK PERFORMANCE

RAISES CO_2 · LOWERS STACK TEMPERATURE
SAVES UP TO 30% IN OIL
NO SMOKE OR SOOT · POSITIVE OIL CUT-OFF
SUPERIOR AIR AND FLAME CONTROL

The Series "S" Burners are a combination of superior Sun-Ray Design plus the ingenious Shell Developed Combustion Head, producing double oil atomization, positive oil cut-off and a uniform, smoke-free, clean, sunburst flame that gives maximum combustion efficiency.

The Series "S" is but one in Sun-Ray's extensive line of better-built oil burners. When you sell Sun-Ray Burners, you sell the product of one of the leading oil burner manufacturers with a long record of many thousands of happy customers throughout the world.

Sun-Ray Burners are made in all sizes from 0.75 to 25 gallons per hour, not only for standard A. C. current but also for D. C. voltages and special A. C. voltages and frequencies. They also can be designed to meet the special requirements of furnace and boiler manufacturers.

Write for complete details. Visit Booth 678 at the National Oil Heat Exposition, Boston.

A Type and Size for Every Boiler or Furnace

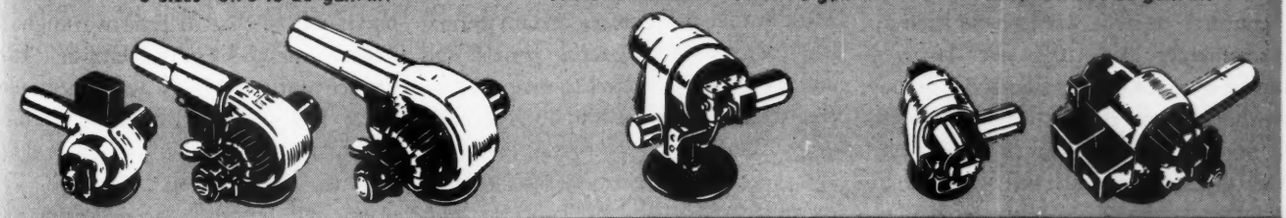
Inquiries invited from Boiler and Furnace Manufacturers

SUN-RAY
FULLY AUTOMATIC
OIL BURNERS

SUN-RAY MODELS
6 Sizes—0.75 to 25 gal./hr.

Series "S"—3 Sizes—0.75 to 6 gal./hr.

MARINE MODELS
4 Sizes—0.75 to 25 gal./hr.



SUN-RAY BURNER MANUFACTURING CORP.
Name formerly Independent Oil Burner Corporation
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service was $44,399.00 which, less labor and material costs of $24,883.00, showed a gross profit of $19,516.00 or 44% on sales, again not including indirect and overhead expenses. During the first year it was not feasible for us to keep records in sufficient detail to get an accurate breakdown on indirect and overhead expenses between "contract" and "call" service. If we charged these to both operations on a dollar of sales basis, we had a slightly lower loss on "call" service but we know that these indirect and overhead expenses are less on "contract" service which I will discuss later.

Of course, we didn't have the final figures for the first 12 months when the time came to do something about sending out renewals for the second year. We did have interim figures which indicated about where we were, and labor rates had gone up so we continued the plan with only one change, we increased the initial charge from $10.00 to $15.00. Again leaving out many details, we pushed "contract" service harder and now have just over 1,500 out of a potential 2,850 eligible burners or 52%. The total of eligible burners does not include new installations because they are on guarantee service for the first year.

We will not know the results for the second 12 months' period until it ends on May 31, but a quick comparison of figures for both fiscal years for the periods from June 1 through the end of February shows the gross profit on "contract" service so far this season to be just about the same as last year. Remembering that we increased the initial charge by $5.00, the gross profit figure should be better but our labor costs increased between June 1, 1948 and the end of February approximately 1/3. Also our income from ½¢ per gallon charge decreased because of a mild winter. It might be wishful thinking, but if this winter through the end of February had been normal, the gross profit on "contract" service would have been approximately 11 2/10% over last year and if by some unexpected good fortune, we should end this heating season with a normal total number of degree days our gross the second full year will be approximately 12 3/10% better than the first. This would be exactly what we are aiming at because we estimate that we can show a small net profit after paying all indirect and overhead expenses if our gross profit works out to approximately 50%. Actually there is every reason to believe that indirect and overhead expenses will be enough lower on "contract" service so that we will not need a full 50% on gross profit. The greatest saving can be effected by reducing unproductive labor time and we know definitely that it has been reduced because of "contract" service. Better than half of our inspections are done on the days when emergency and "call" service is light. Without "contract" inspections to do, it would be very difficult to keep the servicemen busy. Practically all other inspections are made when we have men in the neighborhood answering emergency calls. Naturally this more efficient routing reduces truck operation and expense. Since we do not make out charges or tickets on "contract" service, time is saved in clerical work and billing.

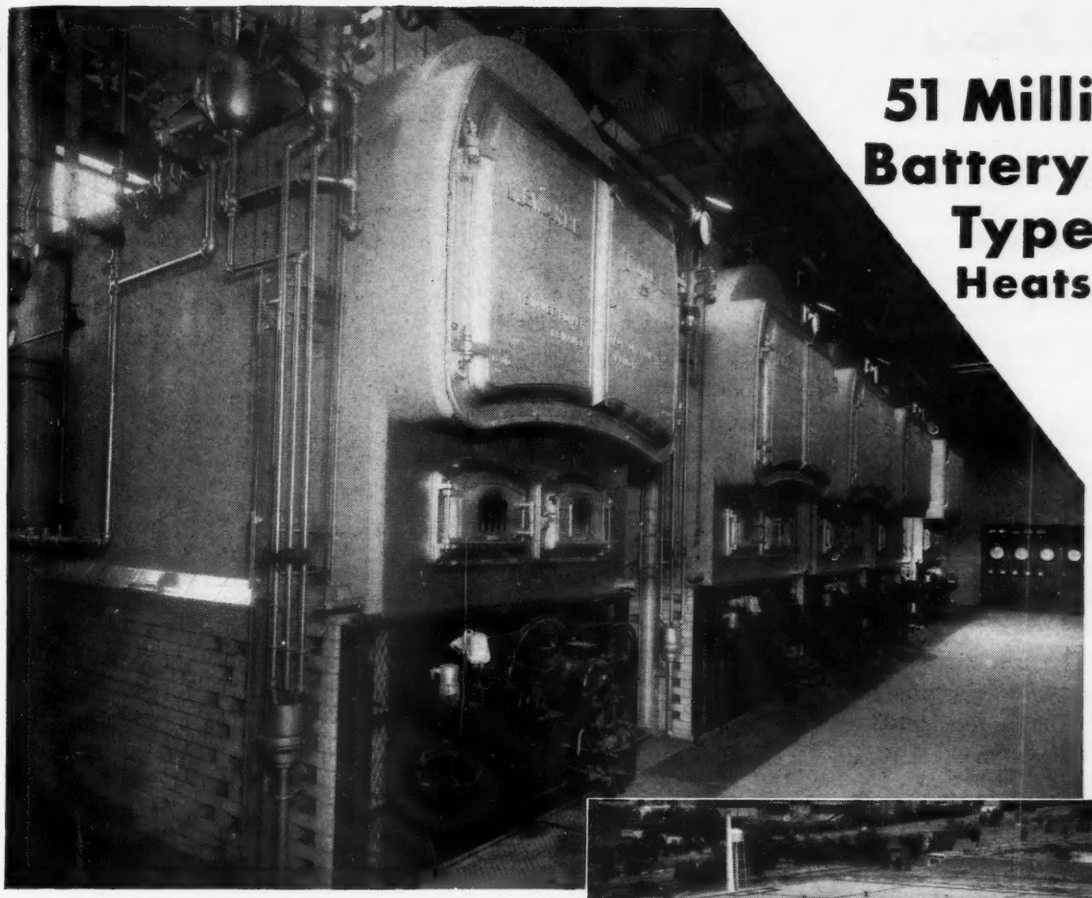
Lost Time Largely Eliminated

Except for peak loads on winter mornings, one man handles nearly all phone calls, dispatches the servicemen and keeps all records and reports on all service. Our servicemen report time spent, work done, parts used, and everything necessary for our records on "C" Service on the back of our time cards which are quite large; pertinent information is transferred to our burner service file cards. There are other economies too numerous to mention such as reduced telephone expense and the elimination of lost time and effort getting authorization to replace defective parts.

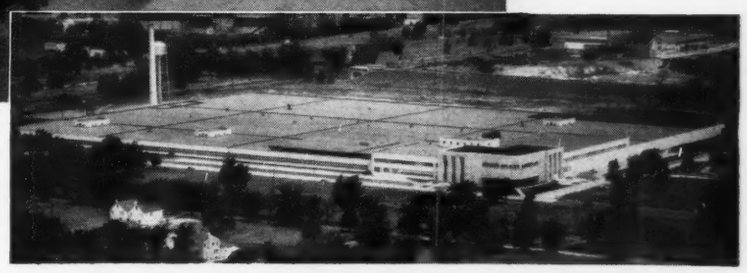
The greatest blessing of all, however, is the virtual elimination of complaints. Unless we pull some honest-to-God boner, our customers have nothing of importance left to argue with us about, and if a serviceman replaces a panel on Monday trying to correct a trouble that is not eliminated until we change the pump on Tuesday, it is our hard luck. Most burner parts have a certain normal life expectancy. Control panels and motors can be expected to give trouble-free service for about 8 to 10 years, fuel units about 4 to 6 years; longer if equipped with fabric type filters. Thermostats, aquastats, limit controls, ignition transformers, ignitors, constant level valves, and a good many other inexpensive parts give indefinite but usually very long service. During the first 12 months when we had 946 burners on "contract" our cost on the parts replacement was $4,529.00. During the calendar year of 1948 we averaged approximately 1,250 burners on "contract" and spent $4,201.00 for parts. Between June 1, 1947 and February 29, 1948, we spent $3,611.00 for parts on 946 burners whereas from June 1, 1948 to February 28, 1949, a comparable period during the second year, our parts expense was only $3,245.00 on 1,500 burners. The obvious conclusion from this is that our greatest parts expense was at the beginning. The first 12 months it was over 21% of income. During the calendar year of 1948 it dropped to 12% of income. For the first 9 months of the first year it was more than 21% whereas for the first 9 months of the second year it is down to less than 10½%. Had the income on fueloil been normal, cost of parts would have been below 10% of income.

Labor costs have also decreased percentagewise even though, as mentioned before, hourly rates are 1/3 higher than at the start. Emergency calls on "contract" burners have decreased steadily from the beginning and although it is largely a "guesstimate" at this time, our records so far indicate that we are approaching the time when we will be averaging fewer calls on "contract" burners than on "noncontract" burners which obviously will enable us to reduce the cost of "contract" service to our customers. In the final analysis this is the key to the whole situation, particularly since we recently were forced to increase the rates on "call" service.

I wouldn't be surprised very much if this combination of circumstances enabled us to increase our percentage of contracts this coming year by as much as 50%. If we are successful, we will then have somewhere around 80% acceptance which is getting close enough to the maximum so that in time we might be able to practically discontinue "call" service entirely. This will accomplish what I think the oilheating industry must do if we are to continue to dominate the automatic heating field. This means selling automatic oilheating as a package to every customer. If we fail to do this, we are asking for real trouble from gas competition.



51 Million Btu Battery of Five Type "C" Heats 20 Acres



This ultra-modern single-story warehouse and office building of Hibbard, Spencer, Bartlett & Co., at Evanston, Ill., offers fitting testimony of this firm's 93 years service to the hardware trade. 1060 by 800 feet—20 acres under roof—set in 35 landscaped acres, it has 3 built-in switch tracks which permit unloading 40 freight cars at one time . . . all within 75 feet of the merchandise bins. A drag-line truck hauling system helps fill orders in 40 minutes.

KEWANEE☆ STEEL BOILERS

So huge is this modern warehouse that it could house 12 full sized football gridirons, spectators and all! Yet the heating job is easy with the flexible battery of five Type "C" Oil-Fired Kewanee Boilers. They can be cut in and out *singly* or used *all at one time* to meet every heating load always with maximum efficiency.

Capable of supplying a tremendous quantity of heat . . . 51 million Btu's . . . these mechanically-fired, low pressure Kewanee's provide steam at low first cost and then continue to show big savings in operating and maintenance costs for the lifetime of the building.

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fuel oil & oil heat

Everyday Snags

Furnace Stays Cool

Although its high limit control was set at 200°, as high a setting as ever is used by this dealer, the burner in this warm air furnace was stopped so much by the high limit control that the house was underheated in cold weather. Believing the limit control defective, the dealer installed another. But the trouble continued.

Then the dealer inserted a stack thermometer at the limit control location and obtained a reading of 220°, and used another thermometer in a warm air duct five feet from the winter air conditioner and obtained at the same time a reading of 145°. This proved that the high limit control had been located too close to the extremely hot heating surfaces of the furnace. Ample heat for coldest weather then was obtained with the high limit control set at 175°, but with this control in a new location about two feet above the furnace unit and in the warm air supply duct.

Room Thermostat Locations

The big "Don't" concerning selecting the location for a room thermostat is:

Don't locate the thermostat on an outside wall.

Try to locate it on an inside wall of an important room, at least three feet from an outside wall.

Where you can arrange it, install the thermostat in a room that chills relatively quickly, compared to the other important rooms in the house, when in cold weather the burner is idle for an hour or so. A corner room with two outside walls and plenty of windows provides a better thermostat location than, for example, a room with only one window and one outside wall. A hall usually makes a poor location for the thermostat because generally it holds its temperature better, with the burner idle.

* * *

Low-Water Controls

The float chambers of external-type low-water controls should be flushed out every two weeks in some instances, and at least once a month in other cases. As he must serve as instructor to the home owners, it's up to the service man to keep himself well informed on the point.

Where unusually large amounts of "tomato soup," rust, and sediment come from a low-water control or water feeder that's being flushed, you may be getting a warning that there's urgent need to treat the boiler water properly with chemicals. Boiler and heating system leaks, rapid deterioration of an expensive boiler, and waste of fueloil, are some of the penalties of failing to treat the boiler water where it needs it.

"On the other hand, if you don't ask for a raise, they're perfectly willing to let you keep on working for what you're worth!"

REPEAT PROFITS
GENERAL FUEL OIL FILTERS WITH THE RED TOP FOR LARGE FURNACES OR BOILERS • HOT WATER HEATERS • SMALL FURNACES SPACE HEATERS
Model 1A-25. 4¾" High. 3½" Dia. Filter Unit Surface 31 Sq. In. ⅜" Pipe Openings.
General FUEL OIL FILTER STANDARD MODEL 1A-25
Model 2A-700. 6¼" High. 4-5/16" Dia. Filter Unit Surface 72 Sq. In. ⅜" Pipe Openings.
General FUEL OIL FILTER MASTER MODEL 2A-700
Model 2A-300. 9-1/16" High. 5½" Dia. Filter Size 63 Cu. In. ⅜" Pipe Openings.
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YEARLY DIVIDENDS
After making the original sale of a GENERAL FILTER, dealers make a dividend each year through the sale of replacement cartridges. The customer, of course, returns to the dealer who made the original installation —and installation is so simple that it can be made in less than two minutes. If you haven't already done so, investigate the profit possibilities of GENERAL FILTERS. See that each one of your customers has one.
WRITE FOR THE NAME OF YOUR NEAREST JOBBER
GENERAL FILTERS INCORPORATED
GENERAL FUEL OIL FILTER
12890 WESTWOOD AVE. DETROIT 23, MICHIGAN
CANADIAN FACTORY BRANCH: GENERAL FILTERS CANADA, LTD., 173 STRACHAN AVE., TORONTO 3, ONTARIO

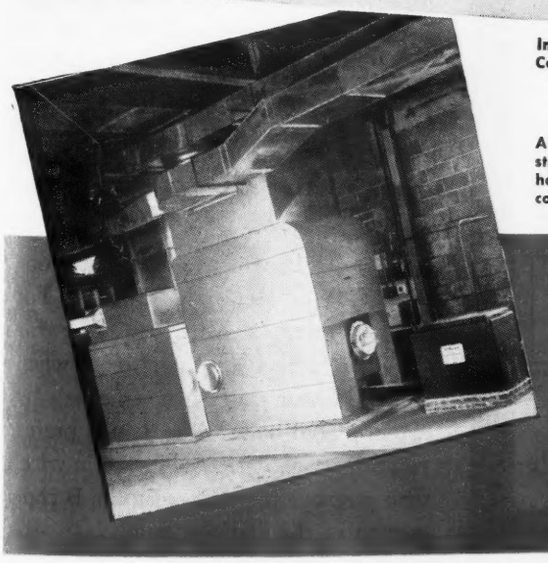
Mr. Henry Ackerman* of Ackerman Plumbing & Heating Company.

"I saved $3500 for my client...

on installation costs by recommending and installing WARM AIR instead of wet heat"

View of Clare County (Michigan) Road Commission Garage. Heating contractor, Ackerman Plumbing & Heating Co. of Clare, Michigan.

Interior view of one portion of Clare County Road Commission Garage.



A Jackson & Church "PoweRated" stoker-fired heater is satisfying a heat loss of 1,600,000 Btu's at low cost. Unit handles 15,000 cfm.

"The Clare County (Michigan) Road Commission has informed me that I saved the County $3,500 by recommending and installing warm air heat for their County Garage. This represented a 30% reduction over the lowest bid for wet heat.

Daily operation cost reports indicate a further savings. The unit installed was a *Jackson & Church — "Powe-Rated" model CC-2000, stoker fired, with an output of 1,600,000 Btu's per hour.* The unit works perfectly. The furnace and blower handle 15,000 cfm with frequent air changes, ample humidification . . . plus filtering.

For 20 years I have been installing only wet heat for big jobs . . . but I have been converted to warm air heating because of the tremendous savings to the customer in installation and operating costs.

I like the extra features . . . *filtered air-humidification — frequent air changes . . . that warm air heating gives.* So do my clients."

* Statement of Mr. Henry Ackerman on file with Jackson & Church Co.

SEE OUR CATALOG IN SWEET'S

J&C . . . AMERICA'S LARGEST AND MOST COMPLETE WARM AIR HEATING LINE

INDOOR COMFORT

A PRODUCT OF

JACKSON & CHURCH CO., SAGINAW, MICHIGAN

"WORK WELL DONE SINCE '81"

fuel oil & oil heat

Servicing 110-Volt Wiring

EVER HEARD of a service man calling in an electrician at midnight because a house was freezing cold and a wiring defect was hard to locate? Or of taking half a day to find a simple short circuit in a junction box? Or of a warm-air furnace jumping around until a factory man traveled 400 miles to get to the trouble job, then took five minutes to find a loose blade in an on-off switch?

You are asking for such things if you go on service calls and don't know all about shorts, open circuits, loose connections, and crossed wires.

Try out the following tricks if you admit you don't know everything about locating wiring bugs speedily. If you are already Sherlock Holmes with wiring, going through these tricks can prove you understand other experts' stunts.

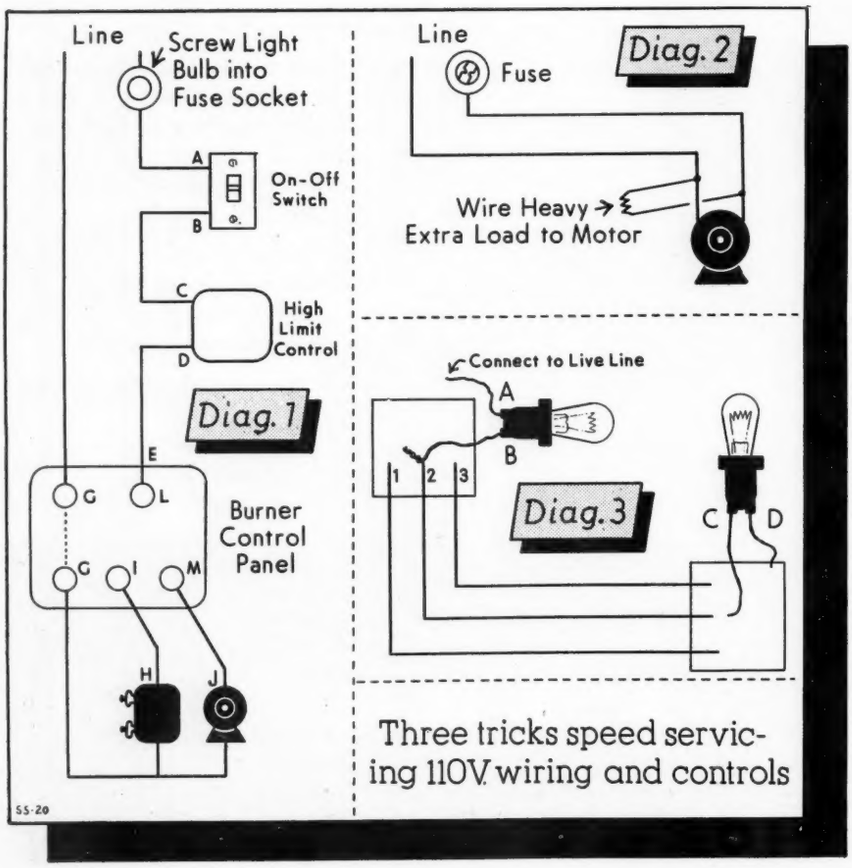
In Diag. 1, screwed into the fuse socket is a light bulb, perhaps 100-watt size. First, this helps locate an open circuit in the 110-volt wiring to the burner panel, which stubbornly keeps the burner idle. Use a short piece of wire, or even a screwdriver with a handle of insulating material, to ground such points in the live leg as A, B, C, D, and E. If, for example, the bulb in the fuse socket lights when your jumper wire or screwdriver touches C and the metal case of the high limit control, but does not light when you touch D, then the open circuit is in this control. You don't need special testers or electrical knowledge to use this trick to locate an open circuit that's keeping a burner dead. You can test all you want to without any danger of blowing fuses. Just be careful not to get a bad shock in a damp basement.

fueloil & oil heat Short Short Article on Burner Service

The idea of Diag. 1 also locates a short circuit that blows fuses. Disconnect at E and screw in the light bulb. If the bulb lights, screwing a fuse into the socket would blow it. Try to close in on the location of the short by turning off the on-off switch for a moment; the bulb goes out if the short is on the load side of the switch. Similarly, try opening the switch of the high limit control to find out if this puts out the bulb. The light usually blinks or goes out if you move the wires or connections causing the short circuit.

In Diag. 2, a heavy extra load is wired in parallel with a burner motor to test for loose connections in the 110-volt wiring. You can use, as this load, a 600-watt heating element that can be bought for about 50¢ in a five-and-dime or hardware store, or a non-automatic electric iron or toaster borrowed from the burner owner. Running the burner with the extra load in the motor circuit tends to show up loose or weak connections by making them splutter or heat up. For a severe check-up on wiring, one expert wires two 600-watt heating elements in parallel with the burner motor, blocks in the on position all the automatic switches in the circuit including the motor starting switch of the burner control panel, then screws a 20-ampere fuse into the fuse socket to start the burner. The calculated overload has burned out a poor connection for him, substituting an easily-found open circuit for a hard-to-find loose connection. Do not damage controls by opening and closing their switches under great overloads.

Diag. 3 shows how to identify the wires that connect two junction boxes. Connect terminal A of the upper test lamp to a 110-volt live line, and terminal B to any of the three wires. Using the same size bulb in the other test lamp, ground its terminal D and try out C on each of the three wires in the junction box at the receiving end of the wires. When you touch C to the same wire B connects to, both lamps will light dimly, giving a signal at each end of the testing rig. Tie labels on the two ends of the wire you've just identified, then identify the others. Your testing is done with no chances of blowing fuses. That's one advantage of using this method. For another thing, a helper working far from you gets a test-light signal when you do. Either man can give signals by blinking both bulbs. Also, if you prefer you can attach wire C to a certain wire, then pick out the wire with the B connection of the first test bulb.



OHI Convention And Show Plans Nearing Completion

CONVENTION PLANS and final arrangements for the National Oil Heat Exposition to be held at Mechanics' Hall, Boston, May 16 to 20, are nearing completion, according to officials of Oil Heat Institute of America, sponsor of the convention and show. Ninety-five per cent of the total floor is taken, and prospective exhibitors are advised to make their choices at the earliest possible time.

Not since 1932 has Oil Heat Institute of America been in Boston with the Exposition and Annual Convention. In planning this joint occasion, which has come to be recognized as the most important annual gathering of its kind in the oil heating industry, OHI's Exposition Committee has projected a show at Mechanics' Hall and a Convention at the Statler Hotel which will vie with the largest and the best ever held anywhere.

The floor space at Mechanics' Hall is as large as that at Chicago's Coliseum, the record show held last year. Since the show held in Boston seventeen years ago, the National Oil Heat Exposition has more than doubled in size. The selection of New England this year shows the industry alert to the possibilities of this market. The Exposition gives the many dealers in this area the support and prestige of the industry as a whole. As it will be extensively and widely publicized and open to the public without any admission charge, it will be a business stimulation of tremendous importance in the market.

The show is being publicized to individual dealers throughout the country by special bulletins, and by continuous advertising in the leading trade magazines. Prior to and during the Exposition, there will be special publicity over the radio and in newspapers in the Boston area.

Direct mail promotion is being carried on to reach various sections of the industry, and allied groups. Material is being sent to selected architects and engineers who will be invited to attend. Special invitations will be sent to the instructors and their classes at Harvard University and M.I.T. and other schools.

Ladies are cordially invited to attend the OHI Convention, and a program of entertainment is being arranged for them in a city and environs which can boast historic landmarks and novel attractions. An interesting reception and entertainment program is being arranged by the Ladies Reception and Entertainment Committee comprising Mrs. F. P. Scully, wife of the President of Scully Signal Company, Cambridge, Mass., chairman, and Mrs. W. F. Briggs and H. W. Loveren, co-chairmen, wifes respectively of the newly elected and retiring president of Oil Heat Institute of New England, and many members.

On Tuesday, May 17, the reception for the ladies will be held in Parlor A, Statler Hotel, starting at 3:30 P.M. The popular traveler, author and lecturer, Edward Rowe Snow, will speak. The reception will be primarily for introductions and the renewal of old friendships, and tea will be served.

On Wednesday, May 18, a day of entertainment for the ladies has been planned. It will start at 9:45 A.M. when the ladies will assemble in Parlor F, Statler Hotel, and begin a tour of famous and historic places which make Boston and its environs a delight to visitors. Buses will be provided, and at 10:00 A.M. the trip will start. It will include residential Boston, Brookline, Cambridge, Lincoln, and take in Walden Pond, beautiful Sudbury, the Massachusetts Institute of Technology, and Harvard University. There will be a stop to see the internationally renowned Ware collection of glass flowers and plants at the Botanical Museum of Harvard University. Longfellow's home, the site of the capture of Paul Revere, Lexington, Concord historical points, and the Christian Science Mapparium also are included in the tour. A pleasant break in the trip will be luncheon to be served at famous Wayside Inn also allowing for time to view the exhibits there. The tour will end at 4:00 P.M.

Ladies will be guests of OHI of America at the reception, tour and luncheon. Those planning to attend should record their names with Miss Gloria Patin, Oil-Heat Institute of America, 6 East 39th Street, New York 16, beginning at once. Necessary tickets and schedule of events will be mailed on registration.

Ladies will also be interested in OHI Annual Banquet and Entertainment which will be given in the Statler Imperial Ballroom on Thursday, May 19, starting at 7:30 P.M. Following the custom of recent years, there will be no speeches at the Banquet and top entertainment will be furnished by a name band and Broadway celebrities. The Banquet will be following by dancing. C. R. Collins, Vice President of OHI of America for the last two years will be toastmaster at the Banquet.

C. R. Collins

Schroeder

Brown

Wright

All Convention meetings and sessions will be held at times not to conflict with the Exposition, and will take place at the Statler Hotel. The first two days—Monday and Tuesday—are devoted to OHI directors and committee meetings, and the annual meetings of OHI of America and of its Accessory and Distribution Divisions.

Speakers announced for the 26th Annual Convention include Dr. W. C. Schroeder, Chief, Office of Synthetic Liquid Fuels, Bureau of Mines; Dr. Courtney Brown, Assistant Head of the Coordination Economics Department

and Head of the Petroleum Economics Division, Standard Oil Co. (New Jersey), and Henry Wright, architect and consulting engineer of New York. The program of convention sessions with speakers and their subjects follows:

On Wednesday, May 18, the Burning Oils Industry Session will be held in the Imperial Room, Statler Hotel, starting at 9:30 A.M. R. S. Bohn, President of OHI of America, will be chairman of the meeting. Dr. W. C. Schroeder, Chief, Office of Synthetic Liquid Fuels, Bureau of Mines, U. S. Department of the Interior, under whose supervision the Bureau's $60,000,000 synthetics fuel research program utilizing coal and oil-shale is being conducted, will talk on "Heating Oils from Petroleum, Coal and Shale." Dr. Schroeder will also show a limited number of pictures to illustrate the work being done at Rifle, Colo. on the removal of shale from the mines and the retorting, as well as that going on at the experimental hydrogenation plant in Louisiana which will be dedicated May 8.

R. S. Bohn

Matheson

J. A. Collins

Kozman

Dr. Schroeder's address will be followed by a "Symposium of Industry Problems," presented by a representative manufacturer and a representative distributor. Representing the manufacturer will be W. A. Matheson, director of Eureka Williams Corporation, and representing the distributor will be J. E. Horton, president, Horton Heating Corporation.

On Thursday, May 19, the Dealer Day Session will be held in the Imperial Room, Statler Hotel, starting at 9:30 A.M. J. A. Collins, National Chairman, Distribution Division, OHI of America, will preside. The session will open with an address by Dr. Courtney Brown, Assistant Head of the Coordination Economics Department and Head of the Petroleum Economics Division, Standard Oil Co. (New Jersey). He will talk on burning oils and the future. A. S. Kozman, Manager, Cook's Oil Company, Oakland, Calif., will address the meeting on "Competition in Automatic Heating." D. A. Packard, Sales Manager, Kelvinator Division, Nash-Kelvinator Corporation, will speak on "The Art of Specialty Selling."

On Friday, May 20, the Architects and Engineering Day Session will be held in the Georgian Room, Statler Hotel, starting at 10:00 A.M. Frank Faust, Manager, Commercial Engineering Divisions, General Electric Company, will be chairman. There will be a

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. . . Because it provides the features your customers want . . .

★ The Whirling Flame. Extracts every bit of useful heat from every last drop of oil, assuring big savings on fuel bills!

★ Unit Engineering. Design and construction as an integral unit results in far greater heating efficiency.

★ "Thermos Bottle" Insulation. Radiation and heat loss are minimized throughout the non-heating season.

★ Beautiful Cabinet. Duotone baked enamel cabinet will blend perfectly with the surroundings.

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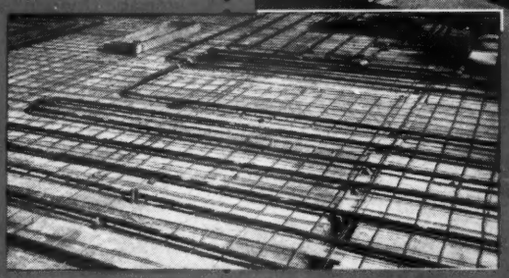
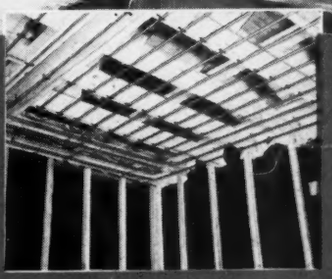
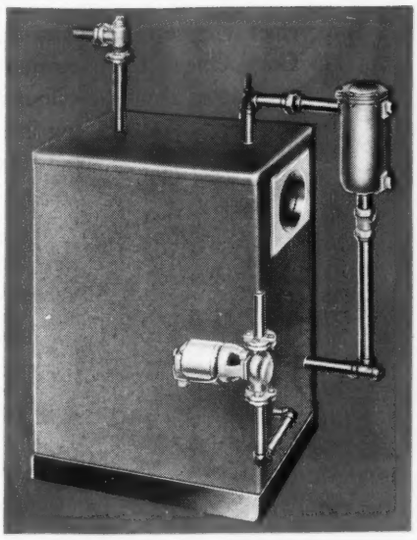


B & G *Hydro-Flo* Radiant Panel Heating bathes the entire house in radiant, sunny warmth from pipe coils either installed in the floor (left) or embedded in the ceiling plaster (right). There's no evidence of the heating system anywhere.



B&G *Hydro-Flo* Radiant Panel Heating



The basic units of a B & G Hydro-Flo Heating System can be installed on any hot water heating boiler.

*Reg. U. S. Pat. Off.

● "What keeps this house so comfortable? Where does the heat come from?"

That's the question universally asked in houses heated with a B & G *Hydro-Flo* System. No wonder home buyers —particularly women—are impressed by this completely concealed heating system. No wonder that men (who foot the bills) are delighted with the economy features of B & G *Hydro-Flo* Radiant Panel Heating.

This *forced hot water* system circulates heated water through pipe coils in the floor or ceiling. It is so accurately controlled that the heat supply is always smoothly proportioned to the weather. Hence, indoor temperature is always supremely comfortable and fuel bills at rock bottom.

And besides, a *Hydro-Flo* Heating System furnishes a year 'round low cost supply of hot tap water in virtually inexhaustible quantities . . . ample for the needs of automatic clothes and dish washers.

A new booklet, "Capture the Sun with B & G *Hydro-Flo* Heating," will give you the complete picture—write today.

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Gerald Bohn

Mehrings

Faust

Packard

forum on the subject of "Lower Heating Costs to Be Realized from Burners or Heat Absorbing Vessels?" Participating in the forum panel as representing various types of burning equipment will be the following: Howard Earl, Chief Engineer, Williams Oil-O-Matic Division, Eureka Williams Corporation; Frank E. Mehrings, Vice President in Charge of Sales, The Meyer Furnace Company; L. N. Hunter, Vice President in Charge of Research, National Radiator Company; Gerald W. Bohn, Vice President in Charge of Engineering, Preferred Utilities Manufacturing Corporation.

Henry Wright, architect and consulting engineer of New York, then will address the meeting on "Recent Progress in Heating and Building Design."

List of Exhibitors*
NATIONAL OIL HEAT EXPOSITION
Mechanics' Hall—Boston
May 16-20, 1949

Exhibitors	*Space No.*
A & C Sales & Supply Co.	123
Aldrich Co.	518
American Artisan	375
American Mohawk Co.	524
American Radiator & Std. Sanitary Corp.	624
American Stove Co.	312
Applied Mechanics Co.	351
Auto Heat Corp.	319
Automatic Devices Co.	591
Bacharach Industrial Instrument Co.	656
Bell & Gossett Co.	610
Bethlehem Foundry & Machine Co.	688
Brown Products Co.	359
Catskill Metal Wks. Co.	511
Century Engineering Corp.	580
Cities Service Oil Co.	570
Cole-Sewell Engineering Co.	550
Coleman Co.	125
Commercial Filters Co.	760
Crotty Mfg. Corp.	231
Delavan Engineering Co.	765-767
Delco Appliance Division	458
Delco Products Division	758
Detroit Lubricator Co.	413
Dielectric Products Co., Inc.	763
Dole Valve Co.	418
Domestic Engineering	465-467
Dongan Electric Mfg. Co.	764
Duo-Therm Division	218
Eckhart Mfg. Co.	560
Eddington Metal Specialty Co.	565-567
Electrol Burner Mfg. Co., Inc.	113
Fairbanks, Morse & Co.	367
Federal Boiler Co., Inc.	757-759
Field Control Division	377
Fiske Products, Inc.	310
Fitzgibbons Boiler Co., Inc.	564-566
Fluid Heat Division	476
Fram Corp.	790
Fuel Oil News	788
Fueloil & Oil Heat	430
General Electric Co., Air Conditioning Dept.	571
General Electric Co., Apparatus Dept.	659-661
General Filters, Inc.	365
General Fittings Co.	513
General Oil Burner Corp.	487-489
General Oil Heating Corp.	554-556
Guardian Products Corp.	690
Gulf Oil Corp.	324
Hajoca Corp.	691
Harbison-Walker Refractories Co.	423
Sid Harvey, Inc.	753, 755
Harvey-Whipple, Inc.	219
Heil Co., The	464-66-68-70
Herco Oil Burner Corp.	530
Herrick Co.	406
Iron Fireman Mfg. Co.	223
Jackson & Church Co.	459
Jefferson Electric Co.	369
Johnson Co., S. T.	795-97-99
Kent Co., Inc., The	371
Kresky Mfg. Co.	417
Kresno-Stamm Mfg. Co. (America) Inc.	654
Master Plumber Htg. Contractor	203
May Oil Burner Div.	664-666
McDonnell & Miller, Inc.	655-657
Mercoid Corp., The	658-660
Metromatic Oil Burner Co.	213
Minneapolis-Honeywell Regulator Co.	781-3-5-7-9-791
Monarch Mfg. Works, Inc.	355
Morse-Smith-Morse, Inc.	756
Mueller Furnace Co., L. J.	477
New England Technical Institute	301
Norge Heat Division	694
Oil Eqpt. Laboratories, Inc.	593
Oil Eqpt. Mfg. Corp.	793
O.H.I. of New England	224
Penn Electric Switch Co.	588-590
Perfex Corp.	581
Plumbing & Heating Journal	131
Preferred Utilities Mfg. Corp.	479-483
Quaker Mfg. Co.	323
Quiet Automatic Burner Corp.	361
Quiet-Heet Mfg. Corp.	766
R.C.S. Tool Sales	130
Radiant Utilities Corp.	609
Rajah Co., The	761
Refractory & Insulation Corp.	230
Reif-Rexoil, Inc.	754
Ret-Rac Corp.	101
Rochester Mfg. Co., Inc.	586
Scully Signal Co.	331
Shell Oil Co.	606
Silent Glow Oil Burner Corp.	210
Smith Co., Inc., H. B.	618
S.O.S. Products Co., Inc.	630
Sparkler Mfg. Co.	769
Staffco Eng. Co.	411
Standard Heater & Oil Eqpt. Co.	224
Stefco Steel Co.	330
Sundstrand Engineering Co.	621
Sundstrand Hydraulic Division	457
Sun Ray Burner Mfg. Corp.	678, 680
Super Electric Products Corp.	771
Swirling Heat Corp.	500
Taco Heaters, Inc.	523
Thatcher Furnace Co.	687
Thrush & Co., H. A.	119
Timken Silent Automatic Division	313-410
Toridheet Division	559
Torrington Mfg. Co., The	424
Tuthill Pump Co.	786
U. S. Machine Corp.	577
Utica Radiator Corp.	510
V & E Products Co.	554
Waltham Oil Burner Co.	406
Waterfilm Boilers, Inc.	587-589
Waterman-Waterbury, Inc.	512
Watts Regulator Co.	357
Weatherall Engineers, Inc.	318
Webster Electric Co.	667
Westcott-Alexander, Inc.	508
White-Rodgers Electric Co.	459-461
Williams Oil-O-Matic Division	695-794
York-Shipley, Inc.	354-6-8-60-2-4-6-8-70

*As of March 21, 1949.

◈

Oscar C. Schroeder, 61, died suddenly on February 26 in his home at Chicago. At the time of his death he was president of Ace Engineering Co. and previously for a number of years had been chief engineer for Automatic Burner Corp. One of the pioneers in the development of domestic oilburners, he also is credited with helping in the development of bomb sights during the war. He is survived by his wife, two daughters and a son.

"In the event you miss a payment-who is your next of kin?"

It is not what we say but what they do that counts

The best advertising of

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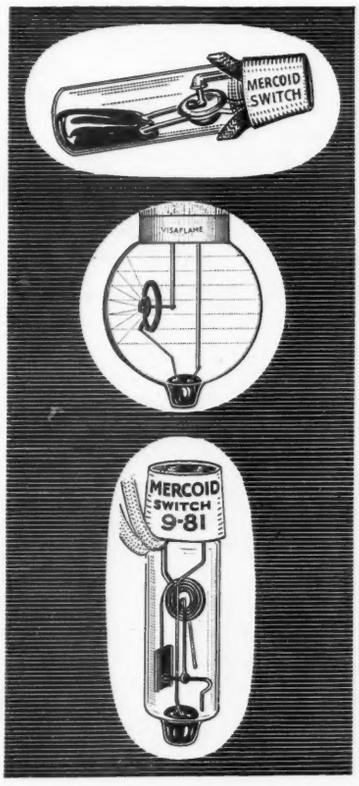
is in their performance



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Proved Oil Reserves Climb To Record High

PROVED RESERVES of crude oil and natural gas liquids in the United States increased more than two billion barrels in 1948, the largest increase for a single year since 1937. Crude oil reserves alone rose nearly 1.8 billion barrels during the year to a total of 23.28 billion barrels, the biggest reserve in the history of the industry.

There were 3,795,207,000 barrels of crude added last year, of which 1,958,853,000 barrels came from revisions of previous estimates; 1,439,873,000 barrels from extensions of old pools, and 396,481,000 barrels from new pools discovered last year. The figures were compiled by the Committee on Petroleum Reserves of the American Petroleum Institute.

Natural gas liquids reserves increased 286,808,000 barrels last year to 3,540,783,000 barrels.

Estimates by the Committee, as in previous years, refer solely to proved or blocked-out reserves. They include only liquid hydrocarbons recoverable under existing economic and operating conditions. Estimates do not include:

1. Oil under the unproved portions of partly developed fields.
2. Oil in untested prospects.
3. Oil that may be present in unknown prospects in regions believed to be generally favorable.
4. Oil that may become available by secondary-recovery methods from fields where such methods have not yet been applied.
5. Oil that may become available through chemical processing of natural gas.
6. Oil that can be made from oil shale, coal, or other substitute sources.

Proved reserves are both drilled and undrilled. The *proved drilled* reserves, in any pool, include the oil estimated to be recoverable by the production systems now in operation, whether primary or secondary, and from the area actually drilled up on the spacing pattern in vogue in that pool. The *proved undrilled* reserves, in any pool, include reserves under undrilled spacing units which are so close, and so related, to the drilled units that there is every reasonable probability that they will produce when drilled.

In the case of new discoveries, both of new fields and of new pools in old fields, which are seldom fully developed in the first year and in fact for several years thereafter, the estimates of proved reserves necessarily represent but a part of the reserves which may ultimately be assigned to the new reservoirs discovered each year. For a one-well field, where development has not yet gone beyond the discovery well, the area assigned as proved is usually small in regions of complex geological conditions but may be larger where the geology is relatively simple. In a sparsely drilled pool the area between wells is considered to be proved only if the geological and engineering data assure that such area will produce when drilled. The total of new

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REMEMBER when you remembered an article in FOH and you wished that you had kept the issue in which it appeared?

More and more FOH readers are getting the saving habit. That's why we've just purchased an additional stock of binders.

Beginning this year in the December issue, there'll be a yearly index which should be another reason for your keeping your copies in a binder.

They hold copies in place with stiff metal blades—copies just can't fall out.

Please enclose your check or money order with your order for a copy. $3 price includes shipping cost.

HEATING PUBLISHERS, INC. 232 Madison Ave., New York, 16

3 Point I=B=R Program

...CONTINUES TO PROMOTE THE INTERESTS OF HOT WATER AND STEAM HEATING

The members of The Institute of Boiler and Radiator Manufacturers make cast iron boilers, radiators, convectors and other equipment used in hot water and steam heating systems. The purpose of this organization is to enlarge home builders' demand for these types of systems and to improve the selling methods and technical knowledge of heating contractors.

The benefits to you of the Institute's advertising and educational program are three-fold:

1

...Creates consumer demand

For the third consecutive year, the Institute has appropriated a considerable sum of money for advertising to consumers in leading shelter group magazines. The advertising emphasizes the advantages of Radiant Ray Heating and offers a free booklet "Enjoy Better Living with Radiant Sunny Warmth." Over 175,000 copies have been distributed to date.

2

...helps you sell

In "Enjoy Better Living with Radiant Sunny Warmth," the Institute has made available to you a convincing, persuasive selling help. Understandably written and beautifully illustrated in full color, this booklet presents all the reasons why hot water or steam systems offer the best buy in heating. Both you and your salesmen can use it to make your sales work more effective.

3

...helps you design and install

In its four Installation Guides, the Institute gives you simplified procedures which cut designing time and assure correctly installed, efficient hot water and steam heating systems. Your profits and your reputation are protected by methods which are a warranty of customer satisfaction. I=B=R Guides are available to you at nominal cost.

Find out how I=B=R can help you to successfully merchandise heating systems — send the coupon now

The *Institute* of Boiler and Radiator Manufacturers

The Institute of Boiler and Radiator Manufacturers
Dept. TM-2, 60 East 42nd St., New York, N. Y.
Please tell me how the I=B=R merchandising and educational program can help my business.

Name.....

Address.....

City.....*Zone*.....*State*.....

oil through discoveries estimated as proved in any given year is generally comparatively small, because development is usually not extensive during the first year. The total of new oil through extensions, on the other hand, is comparatively large. As knowledge of the factors affecting production and reservoir performance becomes available, and as these factors are studied, reserves in older fields can be estimated with greater precision and revised accordingly. Therefore, the total quantity of the new proved reserves for the year includes the oil from discoveries, extensions and revisions of previous estimates.

Figures on crude oil reserves are shown in the following table. The figures represent barrels of 42 U. S. gallons.

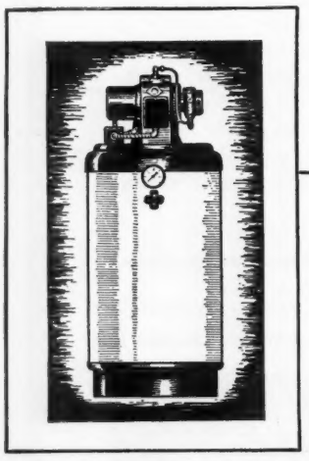
Total proved reserves of crude oil as of December 31, 1947		21,487,685,000
Revisions of previous estimates	+1,958,853,000	
Extensions of old pools	1,439,873,000	
New reserves (new pools) discovered in 1948	396,481,000	
Proved reserves added in 1948		3,795,207,000
Total proved reserves as of December 31, 1947 plus new proved reserves added in 1948		25,282,892,000
Less production during 1948		2,002,448,000
Total proved reserves of crude oil as of December 31, 1948		23,280,444,000
Increase in crude oil reserves during 1948		1,792,759,000

Rural Electrification Gains

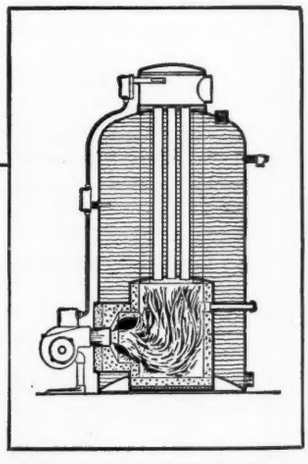
FARMERS ARE BECOMING increasingly important prospects for residential oilheating. This fact has been recognized in several recent statements on future oilburner markets. The table that follows shows that the number of farm homes on electric power lines increased 45% in the three-year period ending with 1947. Some individual states had even higher rates of gain. When the data for 1948 becomes available, it will be clear that the total postwar growth of electrified homes will be substantially more than 50%, and the rate of gain is accelerating with each succeeding year. The figures in the table were compiled by Edison Electric Institute.

Number of Electrified Farm Homes

	12/31/44 *Number*	12/31/47 *Number*
NEW ENGLAND	114,700	135,500
Maine	26,600	32,300
New Hampshire	15,100	17,300
Vermont	17,800	25,700
Massachusetts	32,700	35,200
Rhode Island	3,100	3,400
Connecticut	19,400	21,600
MIDDLE ATLANTIC	264,200	315,400
New York	120,000	141,400
New Jersey	23,300	25,100
Pennsylvania	120,900	148,900
SOUTH ATLANTIC	383,600	628,000
Delaware	5,500	7,000
D. C. & Maryland	23,400	32,000
Virginia	61,300	105,700
West Virginia	37,400	57,800
North Carolina	106,800	173,400
South Carolina	51,700	84,000
Georgia	75,500	131,300
Florida	22,000	36,800
EAST NORTH CENTRAL	653,900	841,300
Ohio	160,400	207,600
Indiana	119,500	157,800
Illinois	114,700	158,200
Michigan	142,600	164,400
Wisconsin	116,700	153,300



2 EASY-TO-SELL, EASY-TO-INSTALL "PACKAGED" OIL BURNER UNITS built by JOHNSON



Dealers find these famous Johnson units especially profitable to sell because they fit the heat and hot water needs of so many buyers . . . and because they come completely assembled, ready to hook up to flue, wiring and water lines.

They are engineered and built to the extremely high standards of performance and efficiency which characterize the entire line-up of Johnson Oil Burners. You can recommend and sell them with complete confidence. May we send you a detailed description?

ECONOLUX 150-V BOILER-BURNERS

Provide abundant low-cost heat and faucet hot water for an 8-room house. Exceptionally compact . . . measure only 24" x 60". Small enough and attractive enough to be welcome in kitchen or laundry if no basement is available. Designed for use with either steam or forced or gravity hot water heating systems. Powered by famous Johnson "Bankheat Burner" with 150,000 BTU output. Faucet hot water is heated in super-efficient double-shell outer jacket on 150 VW models. On steam models 150-VS, faucet hot water may be had by installing Knapsack type heater at slight extra cost. Operation is completely automatic.

AQULUX WATER HEATERS

The hot water needs of anything from a 5-room house to a 500-room hotel can be filled perfectly with one of Johnson's time-tested Aqulux Water Heaters. There's a size and type for every need . . . for homes, restaurants, laundries, hospitals, factories. They deliver automatic hot water, year in and year out, at a cost per gallon that is difficult to match. If you have a water-heating job that must be handled right . . . check up on the performance and the profit possibilities of Aqulux Water Heaters.

Johnson Oil Burners

Builders of fine Oil Burner Equipment since 1903

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940 Arlington Ave., Oakland 8, Calif.
401 No. Broad St., Philadelphia 8, Pa.

10,000 INSTALLATIONS have proved

that Base-Ray Radiant Heating is

.....Easy to install!

NO EXTRA TOOLS—NO EXTRA "KNOW-HOW"

Why miss out on the prestige and profits that result from giving your customers the obvious advantages of Burnham's Radiant Baseboard Heating *simply because you don't know the whole story.*

Have you steered clear of BASE-RAY* Radiant Baseboards because you feared installing them was difficult and complicated or considered them still in the experimental stage? During the past 4 years over 10,000 highly satisfactory BASE-RAY installations have been made in homes, apartment houses and offices. Contractors all over the country report that after the first job BASE-RAY is just as easy to install as conventional radiators.

Have you wondered if BASE-RAY would be too expensive for most home owners? BASE-RAY does cost a trifle more—adding perhaps 3% to the cost of the complete heating system. But it offers a great deal more in comfort and appearance.

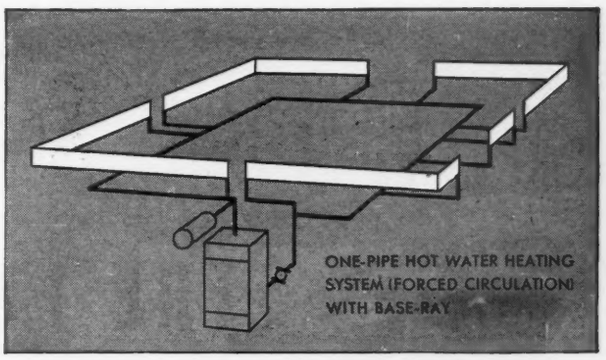
Why not install a BASE-RAY Radiant Heating System on your next job? See for yourself why these 10,000 installations have proven successful.

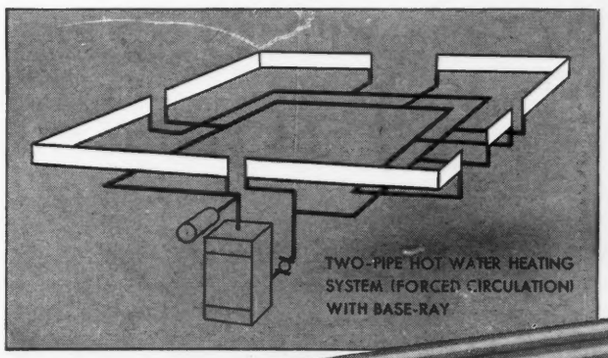
BASE-RAY may be used on all types of Hot Water Heating Jobs—One-Pipe or Two-Pipe, Gravity or Forced Circulation and on Two-Pipe Steam or Vapor Jobs.

*Reg. U. S. Pat. Off.

As these typical layouts show, there is nothing different or complicated about putting in a BASE-RAY heating system.

You follow conventional practice in selecting Boiler and Pipe sizes including Mains, Risers and Branches and all supply and return connections to BASE-RAY are the same as in an ordinary radiator system.





BASE-RAY Units are available in two types, the "HY-POWER" Model, with a rating of 2.08 sq. ft. per lineal foot and the "STANDARD" Model, with a rating of 1.25 sq. ft. per lineal foot.

NOW AVAILABLE—Matching Sheet Metal Baseboards and Fittings for giving a finished appearance to all BASE-RAY installations.

BURNHAM
BASE-RAY
RADIANT BASEBOARD

Write for the Booklet — it explains with simple diagrams and brief text all any contractor needs to know to order and install BASE-RAY.

Burnham Corporation

"PIONEERS OF RADIANT BASEBOARD HEATING"

IRVINGTON, N. Y., Dept. FO-49

Burnham Corp., Boiler Division Dept. FO-49
Irvington, N.Y.

Please send me copy of "Ratings and Installation Guide" on BASE-RAY Radiant Baseboards.

Name .....

Address .....

City..... State.....

Burnham RADIANT HEATING SINCE 1873

fuelfoil & oil heat

	12/31/44 Number	12/31/47 Number
EAST SOUTH CENTRAL	246,500	426,300
Kentucky	64,600	107,100
Tennessee	69,100	107,900
Alabama	64,200	115,900
Mississippi	48,600	95,400
WEST NORTH CENTRAL	369,800	568,500
Minnesota	85,200	124,500
Iowa	119,700	175,700
Missouri	71,700	128,700
North Dakota	6,500	12,200
South Dakota	7,800	13,000
Nebraska	35,800	49,300
Kansas	43,100	65,100
WEST SOUTH CENTRAL	265,400	495,600
Arkansas	41,600	89,200
Louisiana	31,000	67,400
Oklahoma	43,300	81,900
Texas	149,500	257,100
MOUNTAIN	105,200	142,300
Montana	10,700	17,100
Idaho	30,800	38,100
Wyoming	4,600	7,200
Colorado	22,800	32,900
New Mexico	6,900	12,800
Arizona	8,600	11,200
Utah	19,100	21,100
Nevada	1,700	1,900
PACIFIC	226,500	264,200
Washington	66,200	76,800
Oregon	46,400	59,600
California	113,900	127,800
TOTAL U. S.	2,629,800	3,817,100

EDCO NO. S-252

THE FILTER

with 98 sq. in. of surface area

Your BEST Filter Buy For PERFORMANCE and PROFITS

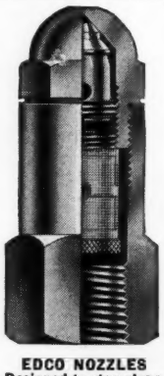
Even microscopic oil impurities are filtered out as oil flows freely thru the 98 square inches of surface area. The specially designed cartridge with the extensive area, gives maximum protection to oil burners, space heaters and water heaters using 1, 2 or 3 fuel oils.

Better Value for Less Money

Because of its extra large surface area EDCO filter lasts longer, gives customers maximum protection and keeps them happy.

And the price is right!

ORDER A SUPPLY TODAY



EDCO NOZZLES
Designed to stay clean longer and TRIPLE-TESTED — for spray angle, atomization and actual rated capacity.

EDCO

EDDINGTON METAL SPECIALTY CO.
P. O. BOX K. EDDINGTON, PA.

U. S. Department of Labor Fueloil Prices January

FIELD INVESTIGATORS for the Department of Labor monthly check prices of principal fuels in several cities in each section of the country. Getting retail quotations from various suppliers in each market, the prices are averaged and published. Those in the table that follow were taken Jan. 15 (cents per gallon):

	Range	No. 1	No. 2	No. 3
Boston	14.53	14.35	12.22	..
Manchester	15.27	14.80	13.00	..
Portland, Me.	14.20	14.20	12.30	..
Buffalo	15.15	..	13.84	13.84
New York	..	..	12.74	..
Philadelphia	..	13.50	12.00	..
Chicago	15.29	14.65	13.67	13.75
Detroit	..	14.60	13.75	13.29
Milwaukee	..	15.12	14.14	14.15
Kansas City	..	13.31	12.68	12.75
Minneapolis	14.77	14.53	13.80	13.83
Baltimore	..	13.36	12.14	..
Wash., D. C.	..	13.60	12.30	..
Jacksonville	..	14.83	13.45	..
Norfolk	..	13.40	11.40	11.40
Richmond	..	13.70	11.80	..
Savannah	..	15.00	14.00	..
New Orleans	..	14.63	12.88	12.88
Portland, Ore.	..	13.94	11.64	7.36
San Francisco	..	13.70	11.38	7.31
Seattle	..	14.77	12.65	7.60

*Price includes 1% sales tax.
**Price includes 2% sales tax.
***Price includes 3% sales tax.

Oilfired Furnaces Drop In Percent of 1948 Units

OILFIRED FURNACES reported to the Bureau of the Census as shipped in 1948 totaled 190,628, or 24.5% of the 776,906 furnaces shipped for all fuels, off from 37.1% oilfired in 1947. These figures do not include the complete oilfired furnace units shipped by oilburner manufacturers.

Of the forced air furnaces reported shipped, those designed for oil accounted for 44.8% in 1948, against 62.5% in 1947. Oilfired gravity furnaces last year were only 2.9% of the total, compared to 6.6% in the year before.

Oilfired forced air furnaces remained the largest individual type of winter air conditioning unit in 1948. Gasfired forced air units were 36% of the total and coal 19%.

CARE AND KNOW-HOW IN REXOIL BURNERS PAY OFF!

by
E. J. Maguire, Pres.
Maguire Engineering Co., Inc.

WE and our representatives and dealers can honestly state the fact that the initial start and test procedure for Rexoil Burners has been cut down. Our installation men report greater ease of installation. Our service men know more about servicing other makes of burners than they do about Rexoil burners. All for the same reason: The Rexoil burner is designed to do a given job; it fits the job; it is pretested and operates properly and efficiently with a minimum of on-the-job adjustment; it stays adjusted and requires no service.

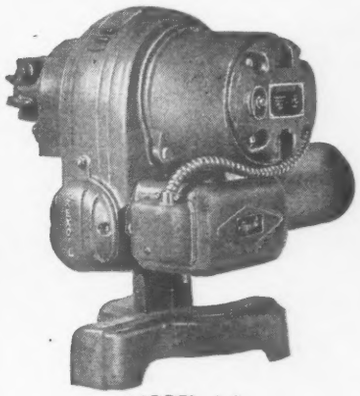
Immediate Fuel Savings

Our customers report immediate fuel savings where we have replaced other burners. One customer had us install a Rexoil boiler-burner unit in a six room prefabricated, basementless bungalow located in a wind swept tract in Pemberton, N. J. This home had an infant child with the resultant increased heating and domestic hot water load on the boiler. In the winter of 1947-48 and during the entire summer following, this unit consumed six hundred and fifty gallons of oil. That winter was 30% colder than any on record. The home owner estimates his fuel bill during normal years should be for five hundred gallons. This type house in this area normally requires one thousand to twelve hundred gallons of fuel. We wouldn't believe it either if we hadn't been supplying the fuel!

Many Satisfied Customers

This is only one case—we have many others on file. We have installed Rexoil units and burners in schools, churches, factories, garages, stores and other types of buildings. We meet with satisfied customers every day. Rexoil gives us all that we could ask in a burner—ease of installation, freedom from call backs, profits, satisfied customers. Could we ask for more?

REXOIL Has Many Exclusive FEATURES at NEW LOWER PRICES



MODEL A-3

Visit us—Space No. 754
Natl. Oil Heat Exposition
Boston
May 16-20

FIRST with HIGH-HEAT COMBUSTION HEAD (patented) for best results with all types of fuel oil.

FIRST with AIR STREAM TURBULATION (patented) for balanced full-floating flame. No pulsation. No smoke.

FIRST with MONOTROL AIR ADJUSTOR (patented) for easy, sure, simple burner adjustment.

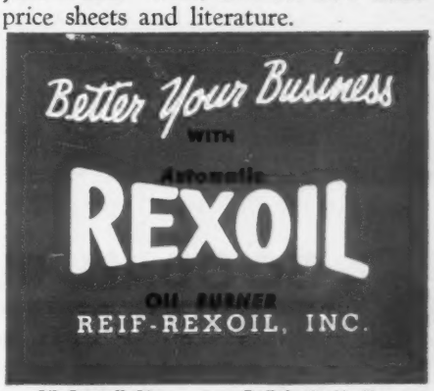
FIRST with QUICK CUT-OFF FUEL HOARDER (patented) for clean starts and stops. No drip. No puffs. SAVES OIL.

BEST with a sound factory policy, a helpful program geared to today's needs and backed by a responsible manufacturer and product reputation unsullied by sharp practices.

Rexoil Boiler-Burner Unit Offers Immediate Sales Opportunities in New Homes

For a fast-selling, profitable item of heating equipment, you will go a long way to find anything comparable to the REXOIL steam or hot water domestic boiler-burner unit. Its advanced design gives it an 80% operating efficiency which means low heating costs. For years of dependable, trouble-free operation, these boilers are built of high tensile special alloy corrosion-resisting steel, deep seam welded into a compact, rugged structure. Large, heat-absorbing flues and a built-in combustion chamber of the finest chrome steel permits rapid combustion and high thermal efficiency.

These units are equipped with the famous REXOIL Model A-3F oil burner flange mounted and having the patented Rexoil "High Heat" Combustion Head. There is an instantaneous, built-in water coil to supply ample domestic hot water year-round. Write now for new trade price sheets and literature.



37 Carroll St. Buffalo 3, N. Y.
We welcome inquiries from established dealers who do not want to be pushed around!

Government May Enter Synthetic Fuel Field

GOVERNMENT MAY ENTER the business of synthetic fuel production if Representative Charles A. Wolverton's bill is adopted. This would put up pilot plants to work on four raw materials; oil shale, coal, natural gas and tar sands, and the products would go to "non-market" uses to avoid competition with private industry.

The bill to put government into synthetic fuel research is under fire in several quarters and the details are not yet settled. In essence it would make possible the construction of plants to produce about 30,000 barrels of synthetics daily. Plants would be built by private industry with RFC financing. If industry refuses or fails to go along with the program, RFC and the Interior Department would be authorized to build the plants as government projects and have them operated by private companies.

The provisions of the bill are in direct conflict with the National Oil Policy recently announced by the National Petroleum Council. The NPC plank on synthetic fuel production says, "The economic and efficient development of synthetic fuels to supplement natural petroleum as needed can best be achieved by private industry. Research by governmental agencies should be limited to fundamental studies and to surveys of raw material reserves. The construction of synthetic fuel plants by government intervention would defeat the objectives of an adequate oil supply by impeding the normal functioning of the industry."

New Brown Cover Makes Hose Last Longer!
RESISTS EXTERNAL WEAR AND ABUSE... PROTECTS CARCASS
NEWTYPE PATENTED CONSTRUCTION PATENT NO. 1948410 FEB. 20 1934
GOODALL RUBBER CO. INC. PHILADELPHIA
SYNPLASTIC GASOLINE
"NEWTYPE" FUEL OIL HOSE
The tougher, longer-wearing brown cover with which "Newtype" is now furnished gives this hose *everything it takes* to make fueloil deliveries *cost less.* The other well-known features still pay off . . . non-flattening, kinkproof construction; non-swelling, oil-proof tube; a full, fast flow that means quicker deliveries; lightness in weight and extreme flexibility, for easier handling. *Contact our nearest branch for prices, or send for new illustrated folder.*
DANGER

GOODALL RUBBER COMPANY

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

Branches: Philadelphia • New York • Boston • Pittsburgh • Chicago • St. Paul • Los Angeles San Francisco • Seattle • Salt Lake City • Houston • Distributors in Other Principal Cities

Est. 1870

Test Oil-Coal Mixture As Diesel Engine Fuel

TESTS to determine the possibility of using a mixture of oil and pulverized coal in diesel engines are reported by Prof. Robert B. Rice of the Diesel School at North Carolina State College. Starting with 10% powdered coal, the coal percentage has been increased to 45% successfully.

As has been found with oil-coal mixtures for burning, the North Carolina experimenters have had trouble keeping the powdered coal in suspension in the oil. Attention now is being turned to possible extra wear the fine coal ash may cause in the engine.

Rochester Checks Industry On Burner Permits

ROCHESTER, N. Y. SHOOK a warning finger recently at firms or persons installing oilburning systems.

Acting on information that a city ordinance requiring permits and inspections as a requisite to such installations has been violated with some frequency, City Manager Louis B. Cartwright dispatched precautionary letters to more than 100 firms.

These went both to installers of oilburners and to suppliers and distributors of fueloil, along with copies of the ordinance requiring the permit and an amendment passed in 1946 prohibiting dealers from delivering fueloil where the required permit has not been obtained.

"Inasmuch as this is the only means by which we can control the unauthorized installation of oilburners," said Cartwright's letter to the supply people,

Petroleum haulers have long wanted an air-operated emergency valve. Here it is—and every bit as fine as all the other Philadelphia Valve products, which have served the industry for so many years.

This is a compact elbow-type valve. It is precision-machined from the finest brass castings, and has a shut-off spring of stainless steel. There's nothing to rust or to get out of kilter. The stuffing box, always troublesome, has been entirely eliminated.

You can mount this valve on any tank truck equipped with air brakes; it will never interfere with normal brake operation. If the air cylinder should ever need servicing, the entire unit can be quickly removed, even when the compartment has liquid in it. You can conveniently locate the compact control mechanism on either side of the truck or at the rear. A slight pressure on the control lever, and you get instant, full flow and the fastest possible unloading. Like all our valves, this one has full areas throughout, and all passages are streamlined.

The bonnet and piston assembly can be removed, in a matter of minutes, with the use of an extractor wrench which is operated through the manhole cover. This type of bonnet eliminates the necessity of steaming and getting into the tank in order to replace the disc. It saves many costly hours of servicing time! (Our mechanically-operated emergency valves also provide this feature.)

Available in two types: Multiple (any single valve or combination of valves can be opened at one time); Massachusetts (only one valve can be opened at one time).

This new emergency valve is one more reason why you'll want to *standardize* on Philadelphia Valve Company equipment. From every point of view—economy, fast unloading, safety, long life, trouble-free performance—Philadelphia Valve Company products set the pace for the entire industry. Ask one of our sales engineers to prove that statement.

Send for catalog 170 for description of the full line, illustrated with engineering drawings.

PHILADELPHIA VALVE COMPANY

3413 ARAMINGO AVENUE, PHILADELPHIA 34, PA.

Pacific Coast Distributor: Oil Marketing Equipment Co., 325 Fremont Street San Francisco 5 Calif.

"we must have full cooperation. At this time, we are receiving such assistance from the great majority of distributors and suppliers. However, there are a few violators and in the future these will be prosecuted to the full extent of the law."

Raymond H. Adams, a director of the Oil Heat Institute of Rochester, said the ordinance was commendable in purpose and in action, as it not only assured proper and safe operation but also gave dealers an idea of the number of new installations.

Degree Day Fluctuations More Violent in the South

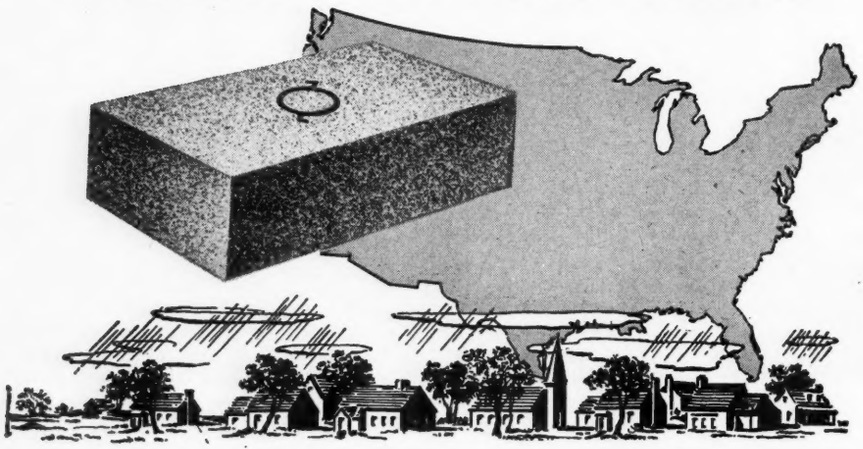
FUELOIL MARKETERS in southern states have problems similar to those of the north, but usually on a more intensified scale. In a region where winter weather is normally moderate, any appreciable change or departure from a normal season makes a very important difference in Degree-Days. Looking over some Degree-Day information supplied by the Charleston Oil Company, Charleston, S. C., it would appear that the drop in Degree-Days this season from last to the end of February was 37.6%. This is nearly twice as great a variation as occurs in the northern markets for the same period.

A year ago the south also had an abnormally cold winter, the same as the rest of the country, with the result that its oil requirements, based on Degree-Days, were 29.4% greater than they had been during the winter two years ago. Again this was several times as great a variation as was found in most northern areas. In actual numbers Degree-Days for the three seasons were 1,791 for 1946-47; 2,318 for 1947-48; and only 1,446 for 1948-49.

It is difficult under conditions of such violent Degree-Day fluctuations to keep operating ratios under control. Where the northern fueloil distributor worried a lot about what to do with the truck drivers during the mild months of this season, the southern fueloil men had much more to think about.

The growth of oilheating in southern states since the close of the war has been particularly marked. As southern fueloil distributors grow to handle larger volume the seasonal ups and downs present a real problem.

Let "A Quarter of a Million Families" Be Your Guide



Send Today
for the
B&W FIREBOX HANDBOOK
a sure guide to customer satisfaction and more sales.

Yes, more than a quarter million families are getting oil heating comfort at a much lower cost because wide-awake and alert dealers have provided them with B&W Fireboxes.

This figure carries a vital sales message for you. It shows that dealers and customers all over the country recognize the advantages of B&W Insulating Firebrick. It proves that they are "sold" on the Fireboxes that —

1. **Save fuel, due to more efficient insulation.**
2. **Minimize odor, soot and smoke.**
3. **Assure smoother, quieter burning.**
4. **Respond quickly to thermostat by reaching temperature quickly from a cold start.**

Follow this lead to increased sales and profits—by showing your customers the benefits of B&W Fireboxes.

R-298

B&W REFRACTORIES PRODUCTS
B&W 80 FIREBRICK • B&W JUNIOR FIREBRICK
B&W 80 GLASS TANK BLOCKS • B&W INSULATING FIREBRICK
B&W REFRACTORY CASTABLES, PLASTICS AND MORTARS

OTHER B&W PRODUCTS
Stationary & Marine Boilers and Component Equipment
Chemical Recovery Units . . . Seamless & Welded Tubes . . . Pulverizers
Fuel Burning Equipment . . . Pressure Vessels . . . Alloy Castings

BABCOCK & WILCOX
THE BABCOCK & WILCOX CO.
REFRACTORIES DIVISION
GENERAL OFFICES: 85 LIBERTY ST., NEW YORK 6, N.Y.
WORKS: AUGUSTA, GA.

"Advancement here is very rapid. As a matter of fact I started here this morning as a porter"

British Oil Prices Drop As Supply Picture Eases

FURTHER CUTS IN OIL product prices have been noted in Britain by the large distributing groups—with some consternation among the smaller independent operators who fear a revival of the price cutting war of the '30s. Latest cuts are announced by the Shell-Mex and B. P. group and the Anglo-American Oil Co., and amount to one halfpenny per gallon for gas and diesel oils.

fueloil & oil heat

BOOK SHELF

Here's 7 on it YOU May Have Missed

BEACON BOILER BOOK
Only complete, comprehensive boiler book. New and revised edition. Embraces ratings and specifications of every boiler built in U. S. Handy size, 8 by 11 inches.
$3.

BETTER OILHEATING
Covers trouble shooting, field repairs and efficiency tests for oil saving in a collection of articles based on practical experience. For study or reference. 110 pages, 140 illustrations. Size, 8 by 11.
$2.

THE SELLING MAN
Specialty salesmanship in our day with emphasis on burner selling by W. A. Matheson, of Eureka Williams Corp., long a leading figure in oilheating industry. Blue cloth binding, 6 by 9, 260 pages.
$5.

CATALOG OF OILBURNER MANUFACTURERS
350 names of manufacturers of all types domestic, industrial, and commercial conversion burners, boiler and furnace burner units, space heaters, cooking equipments, water heaters, etc. Also 400 trade names. Gives location of company, names of principal executives, and list of products (not specifications). 20 pages, 7" x 10". All paper. No covers.
$2.

BASIC SERVICE TEXT FOR PRESSURE TYPE BURNERS
This manual was prepared by G. T. Kaufman, technical secretary of the Oil Heat Institute of America, and is intended for basic training of installers and service men in residential oil-heating. It is also a useful reference source for those who have completed the training courses. A good, elementary book. Contains quiz questions to brush up with. Pocket size. 216 pages. Paper covers.
$2.

REDUCING FUEL OIL BILLS
This booklet will help you show home-owners, in a language they can understand, how you can save them money. Minimize your customers' oil bills and make a real profit with the right kind of service.
50c

OIL HEATING HANDBOOK
Revision of famous text by Han A. Kunitz giving complete data on all phases of oilheating. An indispensable guide to sellers and installers of equipment. Many illustrations, charts, diagrams and graphs. Lists types of service troubles and includes estimating tables. 456 pages.
$5.

Because of the thousands of small orders we receive we ask that cash, stamps, money orders or checks be sent with all orders.

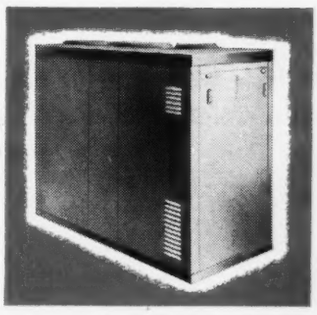
FUELOIL & OIL HEAT
232 Madison Ave. New York 16, N. Y.

A NATIONALLY ADVERTISED Winter Air Conditioner... That Helps You Sell UP

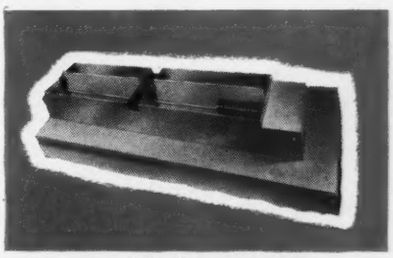
Kaustine offers you a complete line of Oil Fired Winter Air Conditioners for the home . . . topped by a nationally advertised De Luxe Model.

Here, in these 5 models, you will find units for every home and every pocketbook, with ratings from 60,000 to 270,000 B.T.U.

The De Luxe Units, as advertised in Better Homes and Gardens, include these De Luxe features—Airflo-Meter, factory wired controls on front panel, service door electric switch, extended limit control—in addition to the features of the basic model . . . giving you an opportunity for extra profit while providing your customers with greater wintertime heating comfort.



BASIC MODELS, without De Luxe features, are for installation where price is a major factor. 4 sizes—from 80,000 to 270,000 B.T.U. Pressure type blower forces filtered, pre-heated air over large streamlined combustion chamber. Radiation shields keep air in constant contact with heating surfaces.



KAUSTINE AIRFLO-METER—the *MAJOR* control of De Luxe equipment — automatically modulates the flow of air to eliminate the drafty sensation that causes what heating engineers know as a "cold seventy." The Airflo-meters are placed immediately on top of the furnace casing. They are connected to the return (cold) intake, to the warm air outlets, and to the ducts of the heating system.

High Boy (65,000 B.T.U.) and Low Boy (60,000 to 80,000 B.T.U.) factory assembled units are also available.

Write for complete information to
KAUSTINE COMPANY, INC.
Perry, N. Y., Dept. DC

Kaustine

● BACKED BY NATIONAL ADVERTISING . . . BY MORE THAN 34 YEARS SERVICE TO THE AMERICAN HOME OWNER

Modulated Warm Air Furnaces, Septic Tanks, Septic Sewage Disposal Equip., Metal Tile Connectors, Oil and Gasoline Storage Tanks, Hydro-Pneumatic and Water Storage Tanks, Pressure Vessels, Truck Tanks, Custom Built Fabricated Equip., Transfer Pumps

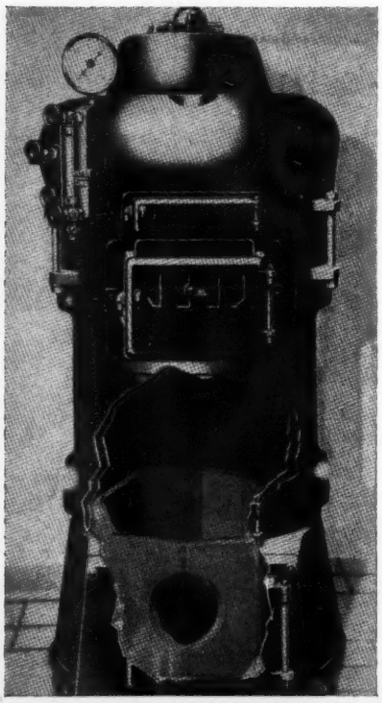
Whether this trend will continue remains to be seen. It will make little difference as yet to the economic balance between oil and coal, and as house firing and many other uses are still not encouraged, will not assist domestic or commercial users for internal use to any extent. The downward trend is, on the other hand, a welcome trend from the viewpoint of consumers generally, who do hope that it is a continuing trend back towards more economic prices.

Shell gas oil (for diesel engines and other industrial purposes), B. P. gasoleum (for fishing vessels and small marine craft) and Shell domestic fueloil (for domestic heating) are the Shell-Mex-B. P. grades affected, while the Anglo-American grades are described as Esso gas oil, heating oil, diesel medium and marine diesel medium. A reduction of ¼d per gallon has been made on prices for Pool Derv oil (for diesel engine road vehicles).

Rising oil prices prevailed from early in 1947 until November last, soon after the Government-fixed prices for petroleum products became maximum permitted prices. Reductions in prices of heavy oil and fuel oil were announced on November 16 by both the Shell and Anglo-American groups, although prices of gas and diesel oils remained as they were. Fueloil and heavy fueloil for industrial purposes were cut in price by Shell-Mex and B. P. on January 3, and bunker fueloil prices at U. S. and Gulf ports were reduced by Anglo-American on February 3.

New R & I Combustion Chamber Defies the Highest Temperatures

The improved R & I Combustion Chamber, made of a super-duty, medium-weight refractory, will positively withstand much higher temperatures than those created in the new oil burners. And it will resist severe abrasion and thermal shock.



It heats up quickly, yet retains enough heat in its walls to produce longer burner "off-periods"—resulting in lower fuel consumption.

Is packed in a sturdy carton complete with floor and everything to do a complete job.

Better than ever, the improved R & I Chamber insures long, efficient, trouble-free firebox life.

You can get them from your supply house. Write us for Bulletin OB-99.

REFRACTORY & INSULATION CORP.
116 WALL ST. NEW YORK 5, N. Y.

Chicago 4, Ill. Newark 2, N. J.
Philadelphia 2, Pa.

R&I COMBUSTION CHAMBER

Canadian Crude May Supply Pacific Northwest

CANADIAN CRUDE OIL may find its way into the markets of the Pacific Northwest, according to Robert L. Minckler, president of the General Petroleum Corporation, in a talk before the General Petroleum Foremen's Association. The recent discovery of two new Canadian fields is adding to Canadian petroleum reserves at a very rapid rate, Minckler said.

"It is probable that within 1949 the production of crude oil in Canada will exceed the Canadian requirements, at least in the plains region, and that oil will then be available for movement to the United States by long distance pipe lines. . . .

"The development up there has not reached the point where you can say it will go this way or that way, but further exploration is necessary and is being vigorously prosecuted.

"The natural market for that oil is going to be the United States and a pipe line could be laid from that area to the Columbia River Basin or to the Spokane area or the Seattle area just about as easily as it could be laid into the Chicago area . . ."

There is also a possibility that West Texas crude may eventually flow into California, Minckler stated.

"A year and a half ago the military forces of the United States were alarmed about a prospective shortage of oil products to meet their requirements. Now we find that we are actually in a surplus position, that we have plenty of oil to meet all demands, not only the military requirements, but the civilian requirements as well.

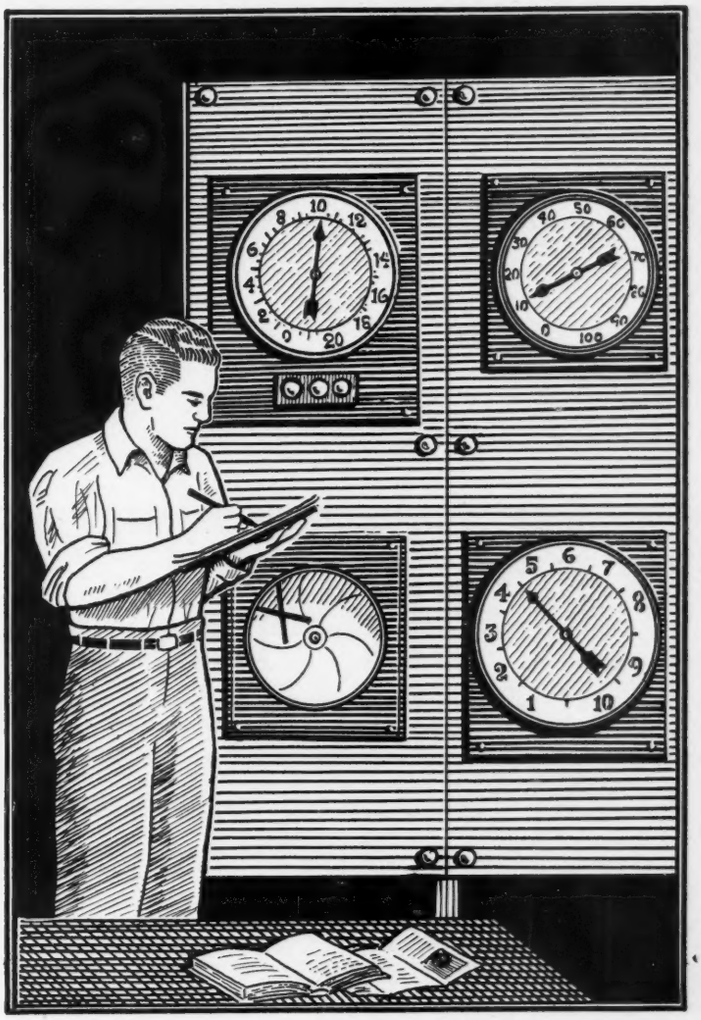
"Anyone who wants oil products now can get them."

EVERY TEST ON THE BOARD

Proves

QUIET AUTOMATIC OIL BURNER

Quality



☆ VALUE

- ★ Nationally advertised.
- ★ World wide distribution.
- ★ Complete range of 7 sizes from 1 to 30 gallons per hour.
- ★ Designed by oil heating engineers.

☆ PRICE

- ★ Just a few dollars more than the cheapest.
- ★ Flanged models for oil furnaces and air conditioning furnaces.
- ★ One-piece casting.

☆ QUALITY

- ★ Westinghouse equipped.
- ★ Minneapolis Honeywell standard safety controls.
- ★ De luxe finishes—modern colors.
- ★ Precision machined.

Manufactured by QUIET AUTOMATIC BURNER CORP., Newark 4, N. J.

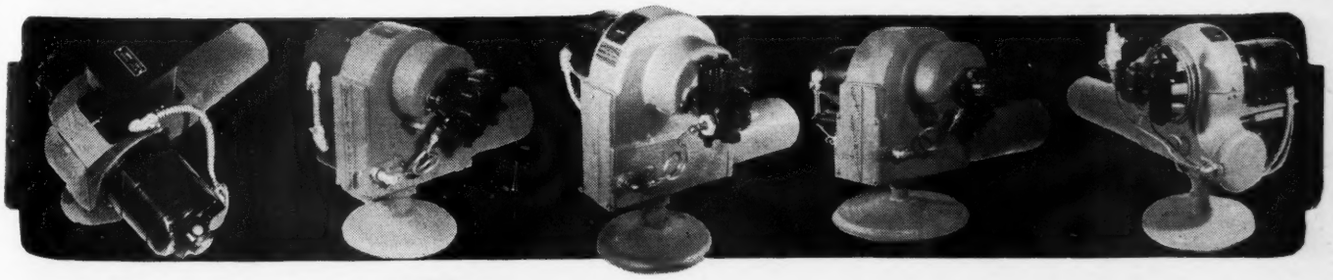
Write or Wire Today

QUIET AUTOMATIC BURNER CORP. • Newark 4, N. J.

FACTORY: 17-19 GROVE ST., MONTCLAIR (Newark Suburb)

Manufacturers and Engineers of

A COMPLETE LINE OF CONVERSION BURNERS MADE IN 6 SIZES From 1 Gal. to 30 Gals. Per Hr.



Industry Groups

Activities of local and national industry associations are reported monthly in this department. Secretaries are invited to send reports of their Group's activities to reach the editor by the 20th.

Four Warm Air Schools Added to Comfort Conferences

FOUR ADDITIONAL Indoor Comfort Conferences have been added to the 1949 program being conducted by the National Warm Air Heating & Air Conditioning Association, Cleveland 14, Ohio. George Boeddener, secretary, explains that the additional sessions have been arranged to meet the demand for more warm air schools in the East and Midwest. Three-day schools were held at Hartford, Conn. on March 30, 31 and April 1 and others are scheduled at Toledo, Ohio, April 18-20; Milwaukee, Wis., May 4-6 and Charlotte, N. C., May 25-27.

The total number of Indoor Comfort Conferences in this year's series is thirteen, with several more contemplated in Baltimore, Lewiston, Me. and Long Island, N. Y. Dates will be announced later and Mr. Boeddener suggests interested parties contact Association headquarters for further details.

Reorganize and Expand Minnesota OHI Association

THE FORMER Oil Heat Institute of Minnesota has been reorganized and renamed the Upper Midwest Oil Burner Association and is now operating in the interests of oil heat dealers in Minnesota, North Dakota, South Dakota, northern Iowa and northern Wisconsin. H. F. Horning, well-known oil jobber spokesman in the territory, is serving as executive secretary of the new group and E. Jarnig, Petroleum Service, has been elected president.

The purpose of the new group has been described as an effort to promote common oil heat interests in the territory by banding oilburner and fueloil dealers into an active association. Dealers in the area who are interested in participating are urged to contact Mr. Horning at 420 Syndicate Bldg., Minneapolis 2, Minn.

Atlantic Oil Conference Opposes Import Controls

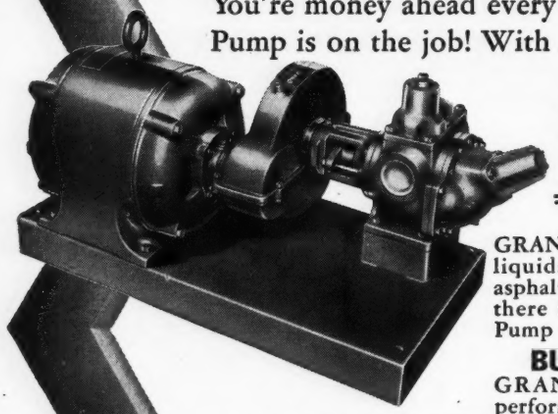
HARRY B. HILTS, executive secretary of the Atlantic Coast Oil Conference appeared before the Senate Finance Committee in late February to present a statement in opposition to the setting of import quotas for petroleum products. In other words he was opposing the viewpoint set forth by the Independent Petroleum Association of America which has been trying to get Government to step in and restrict imports in order that domestic oil producers might have a better local market.

Hilts based his arguments on three principal grounds (1) Government control of oil imports would be just another step toward eventual government control of the oil industry as a whole (2) Restricting imports would only serve to artificially bolster petroleum prices in this country and in turn retard the growth of oil demand in competition with other fuels (3) That while it might be advantageous to the citizens of Texas and a few other oil producing states to

IN BULK PLANT OPERATION PUMP MORE GALLONS AT LESS COST WITH GRANCO

You're money ahead every minute a GRANCO Pump is on the job! With a GRANCO you get

LOWER INITIAL COST
LOWER MAINTENANCE COST
LOWER OPERATING COST
LONGER TROUBLE FREE LIFE
=LOWER COST PER GALLON



GRANCO Pumps handle any petroleum liquids efficiently, from gasolines to asphalts. Whatever your requirements, there is a quiet, compact GRANCO Pump that will do the job better.

BULK TRANSFER PUMPS

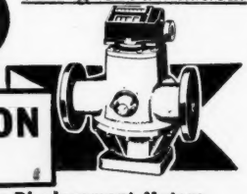
GRANCO PUMPS give unexcelled performance in Bulk Plant or Transfer Station work. High vacuum, high lift. Never need priming at start or finish of loading operations. No "bleeder" lines. Reversible action and four ports fit pump to any pipe hook-up. At left, Model DEES—90 GPM Pump with gear drive in oil-tight housing.

HERE'S WHY GRANCO PUMPS ARE BETTER!

The exclusive, patented ball and squeeze action of the GRANCO spherical rotor—only moving part—provides direct positive expulsion from pump chamber into line of flow. Quiet, friction-free, no contact between rotor and housing—for better performance, longer wear. No gears, blades, scoops, valves or dragging parts.

See your distributor, or write for full particulars. Sales and Service "at your service" throughout the nation.

Granco



GRANBERG CORPORATION
Oakland 8, California

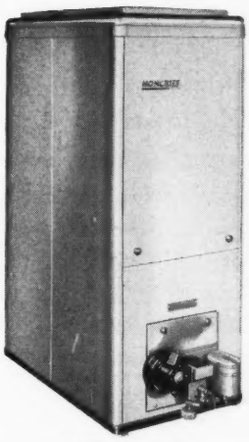
Also makers of Granco Rotary Positive Displacement Meters

You get *ALL* the *FEATURES*... in MONCRIEFS new "YEARS AHEAD" Pressure Vaporizing *OIL FIRED UNITS*

They're a "CINCH" to Install

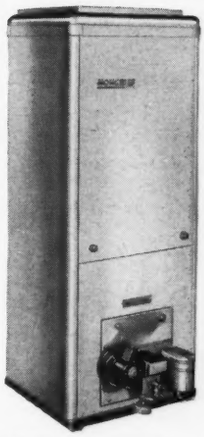
They're a "CINCH" to Service

AND They're Underwriters approved to burn No. 3 OIL

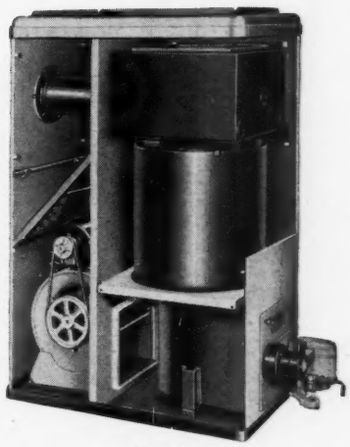


76,000 Btu Output
No. VL-65 Air
Conditioning Unit

75,100 Btu Output
No. VU-75 Utility
Unit



60,600 Btu at Register
No. VW-61
Gravity Furnace



Interior View of
Air Conditioning Unit

It's a matter of minutes to install or remove the complete Moncrief oil burner.

Yes, it's a "CINCH" they are your best bet in meeting the demand for moderately priced—high quality—good looking, oil fired heating units.

These attractive units with baked enamel finish and attractively rounded corners are factory assembled and ready for installation of oil burner. To install the factory adjusted pressure vaporizing burner in the combustion chamber is merely a matter of minutes. Burner installation is unusually simple through the use of a burner mounting plate which locates the burner in exact, correct position. You then tighten only 4 screws . . . connect the oil line and the burner is completely installed.

Removal of the complete burner unit for inspection or servicing is just as simple an operation as installing it.

These "Years Ahead" pressure vaporizing burners are Underwriters' Laboratories approved for burning No. 3 fuel oil as well as lighter domestic grades.

Your Moncrief jobber can supply complete information. Write for illustrated, descriptive literature.

THE HENRY FURNACE COMPANY

Medina, Ohio

HEATING AND AIR CONDITIONING UNITS — MONCRIEF SINCE 1895 — FURNACE PIPE AND FITTINGS

fuel oil & oil heat

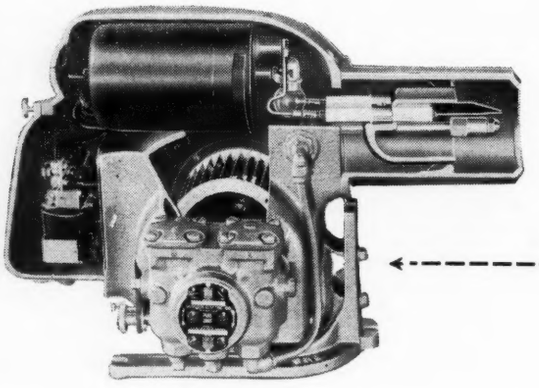
artificially maintain high prices, it was definitely detrimental to the citizens of all other states who have to pay excessive prices for an important item in their living costs.

Convention and Meeting Held by New England OHI

THE ANNUAL MEETING and convention of the Oil Heat Institute of New England, Boston 15, Mass., was held in the Hotel Statler on March 25. Morning sessions heard the annual reports from officers and elected a new slate of officers. William F. Briggs, Valley Oil Co., Middletown, Conn., was named president and Joseph F. Walsh, Thomas D. Russo, Inc., Roslindale, Mass. and William H. Flood, Converse-Carlisle Coal Co., Springfield, Mass., were elected first and second vice-presidents, respectively. Fred N. Beckwith continues as secretary-treasurer.

Convention gatherings included a luncheon, followed by a round table discussion and the annual banquet. Dr. Murray Banks, psychologist, was luncheon speaker on the subject of human relations. Robert Gray, business manager, FUELOIL & OIL HEAT, was moderator of the panel discussion, which featured John R. Sherwood, president, Sherwood Bros., Inc., Baltimore, Md.; Herbert M. Spade, manager, Oilheating Div., E. Robison, Inc., Hartsdale, N. Y. and L. B. Fox, manager, Fueloil Div., Socony-Vacuum Oil Co., New York. The general text of the round table forum, which emphasized service department problems and operation, is reproduced elsewhere in this issue.

R. M. Sherman, president, Silent Glow Oil Burner Corp., Hartford, Conn., acted as toastmaster at the annual banquet, at which Harold G. Hoffman, former governor of New Jersey, was the principal speaker.



It's the INSIDE that SELLS!

OIL BURNER or no . . . you're actually selling your customers COMFORT. The uninterrupted comfort of a Herco Oil Burner.

And when you sell HERCO, you'll be glad to talk about the features "under the hood": Exclusive Herco Thrifti-fier that concentrates heat on heating surfaces . . . Mercoid Visaflame that ends need for high stack temperatures . . . and finally Herco Unit Engineering which integrates fine parts into a balanced unit of peak combustion efficiency . . . a burner that's guaranteed to satisfy!

HERCO OIL BURNER CORP. Lancaster, Pa.

Western States Representative
Harold Winningham & Company
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HERCO
The Oil-Thrifty
OIL BURNER

VALUABLE DEALER FRANCHISES ARE AVAILABLE. GET IN TOUCH WITH US!

Wells Addresses Meeting Of Massachusetts Dealers

THE MONTHLY MEETING of the Massachusetts Oil Heating Association, Inc., Watertown 72, Mass., held March 15 at the Fox and Hounds Club, Boston, featured an address by Joseph B. Wells. Mr. Wells, new executive director, Independent Oil Men's Association of New England, discussed "Our Obligation to the Consumer." Members of the IOMA were guests of Oil Heating Association.

Fred N. Beckwith, honorary secretary-treasurer, rendered his monthly report on current industry problems, with particular emphasis on the pending legislative measure to license Massachusetts oilburner installers and service men. The bill, as proposed, requires each applicant for license to have taken a course of at least one year in oilburner engineering at an accredited school, to have had one year's apprentice experience and to take a written examination.

Announce Dates For Warm Air Mid-Year Meeting

PRELIMINARY announcement has been made by the National Warm Air Heating & Air Conditioning Association of the date and place of its mid-year convention. The sessions will be held in the Edgewater Beach Hotel, Chicago on June 21 and 22. A more detailed announcement to include specific information on meetings and speakers will be released at a later date.

Only THRUSH FLOW CONTROL VALVES Have This

PATENTED VENT BELOW SEAT

Hundreds of thousands of these valves now in use are giving trouble-free service.

Eliminates Leakage

THE PATENTED vent which relieves pressure below the seat in a Thrush Flow Control Valve is only one of the features which make this valve outstanding. It has no tight fitting guides. There is nothing to bind or stick. Shut-off is positive. It is easy to install . . . and eliminates the need for a union. The convenient manual adjustment does not interfere with normal operation. With all its important advantages, the Thrush Flow Control Valve costs less than competitive valves. It is used with a Thrush Water Circulator to control circulation and prevents wasteful overheating in automatic Forced Circulating Hot Water Heating Systems. Ask your wholesaler about it today or write Department C-4.

THRUSH WATER CIRCULATOR

H. A. THRUSH & COMPANY • PERU, INDIANA

FORCED CIRCULATING

Summer-Winter Hot Water Heat

NPA's Semi-Annual Meeting To Be Held At Cleveland

APRIL 13, 14 and 15 have been announced as the dates of the 46th semi-annual meeting of the National Petroleum Association, Washington 4, D. C., to be held at the Hotel Cleveland, Cleveland, Ohio. Fayette B. Dow, general counsel, explains that informal group sessions are planned for April 13, with general sessions scheduled for the following day.

These will commence with a morning meeting of the board of trustees and a joint meeting of the NPA Department of Taxation and the Subcommittee on Taxation, American Petroleum Industries Committees. The Petroleum Club is sponsoring a luncheon on April 14, followed by a session featuring several speakers, including "Petroleum supply and demand—review and outlook," by Richard J. Gonzalez, economist, Humble Oil and Refining Co. A cocktail party and the annual fellowship supper will complete the day's program.

Sessions on April 15 are scheduled to include a joint meeting of the NPA Department of Manufacture and Department of Standards and Tests and a meeting of its Department of Industrial Relations.

I-B-R Campaign for Radiant Heating Enters Third Year

FOR THE THIRD consecutive year the Institute of Boiler & Radiator Manufacturers, New York 17, N. Y., has appropriated an advertising fund for campaigns in consumer shelter magazines, to stress the theme "Radiant Ray Heating." Coupled with its consumer booklet, "Enjoy Better Living with Radiant Sunny Warmth," 175,000 copies of which have been distributed, the advertisements points out the advantages of hot water and steam heating with radiators, baseboards, panels and convectors.

Contents of the book comprise a comprehensive and persuasive sales talk on the advantages of radiant heating, which, it is pointed out, can be used effectively by installers and salesmen. Four installation guides, available from the Institute at 25¢ each, assist in the proper design and installation of systems.

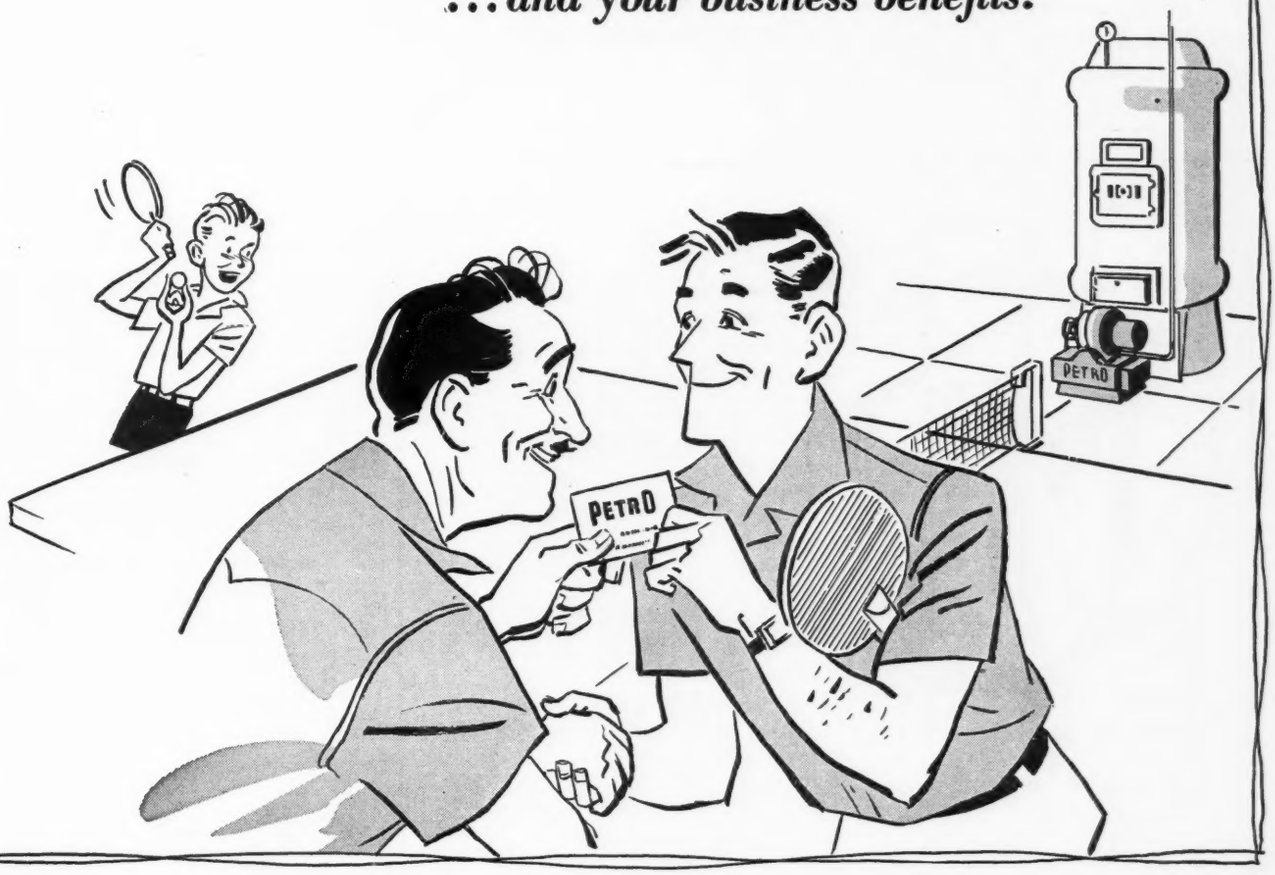
Oil Progress Week Planned By Information Committee

OUTSTANDING SPECIAL EVENT of the oil industry's information program in 1949 will be "Oil Progress Week," which has been set by the Oil Industry Information Committee, New York 19, N. Y., for the third week in October. Emphasis this year, as with "Oil Progress Day" in 1948, will be laid on local oil men presenting the industry's story to their own communities. Expanding this activity to cover an entire week is designed to afford oil men and oil companies a longer period in which to tell their stories to communities. Complete materials and plans for such activities will be supplied by the Committee well in advance.

Since 1949 is the ninetieth year after the drilling of the Drake well, the theme: "Ninety Years of Progress" will be used, during "Oil Progress Week," as well as at other times during the year. During "Oil Progress Week" emphasis will be placed on explaining how the public benefits from the industry's constant and extensive research, its progressive devel-

When you install a PETRO it soon starts selling the neighbors!

...and your business benefits!



GOOD NEWS, Petro news, travels fast. Give your customer a Petro installation—and the fine heating performance that goes with it—and he'll tell his friends. Everyone he meets will hear of Petro year-round reliability and economy—to your benefit and profit!

The established plumbing and heating jobber in your wholesale trading area will gladly give you details on the *complete* Petro line—including oil burners, boiler-burner units, furnace-burner units and water heaters.

PETROLEUM HEAT AND POWER COMPANY
Stamford, Connecticut

Makers of Good Oil Burning Equipment Since 1903

REFINERIES... FUEL OIL STORAGE AND DISTRIBUTION TERMINALS
NATIONWIDE OIL BURNER SALES AND SERVICE FACILITIES

WHAT ELSE DO YOU GAIN WITH PETRO?

OUTSTANDING SELLING FEATURES, such as patented "Tubular Atomization" assuring your customer more heat from less fuel.

VIGOROUS PROMOTION THROUGH NATIONAL ADVERTISING, reaching every oil burner prospect in your territory . . . building up a preference for Petro and helping pre-sell *you* as a leading heating contractor in your community.

PRODUCT DEPENDABILITY, reflecting over 45 years' oil heat "know-how" of the world's oldest, largest exclusive oil-heat equipment maker.

PETRO
REG U S PAT OFF
OIL BURNERS • BOILER-BURNER UNITS
FURNACE-BURNER UNITS • WATER HEATERS

fuel oil & oil heat

opment of improved and new products and services, and the advantages to the consumer of the industry's widespread system of local distribution.

API Appoints Committee For Marketing Studies

J. HOWARD MARSHALL, vice-president for marketing of the American Petroleum Institute, has appointed a committee of 21 oil and association men to investigate the possibilities of undertakings to help oil marketers and their associations, particularly along research lines. B. L. Majewski of Chicago is chairman. The members are:

R. F. Baity, Standard Oil Co. (Indiana), Chicago;

R. M. Bartlett, Gulf Oil Corp., Pittsburgh;

R. S. Bohn, Oil Heat Institute of America, Inc., New York City;

W. C. Burns, Hartol Petroleum Corp., New York City;

F. Warren Butler, Standard Oil Co. (New Jersey), New York City;

Royal E. Decker, Plymouth Oil Co., Detroit, Mich.;

Don. M. Dickey, Northwest Petroleum Assn., Wayzata, Minn.;

John Dressler, New Jersey Gasoline Retailers Assn., Hackensack, N. J.;

J. B. Fisher, Kendall Refining Co., Bradford, Pa.;

Harry K. Franklin, National Congress of Petroleum Retailers, Inc., St. Paul, Minn.;

J. Parks Gwaltney, National Oil Jobbers Council, Durham, N. C.;

Harry B. Hilts, Atlantic Coast Oil Conference, Inc., New York City;

Elzie Huot, Illinois Petroleum Marketers Assn., Kankakee, Ill.;

Walter Hochuli, The Texas Co., New York City;

Carl R. Jonswold, Arrow Petroleum Co., Forest Park, Ill.;

Harry J. Kennedy, Continental Oil Co., Ponca City, Okla.;

E. J. McClanahan, Standard Oil Company of California, San Francisco;

Joseph L. Nolan, Farmers Union Central Exchange, Inc., St. Paul, Minn.;

Rankin P. Peck, National Congress of Petroleum Retailers, Inc., Detroit, Mich.;

J. B. Saunders, Triangle Refineries, Inc., Houston, Texas;

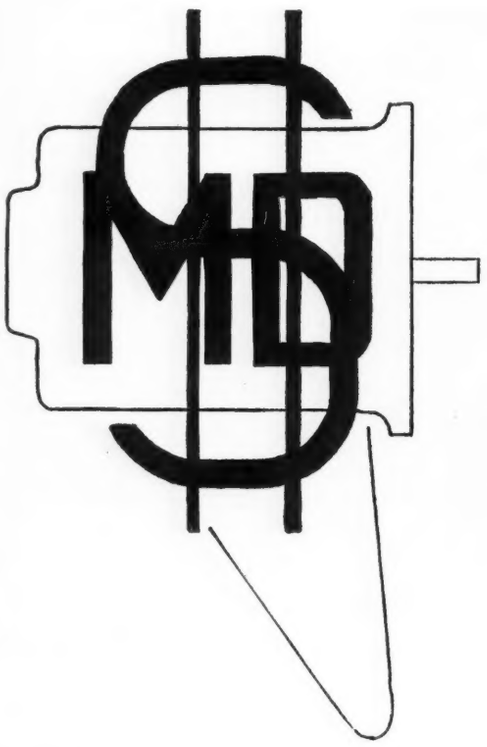
C. J. Westcott, Westcott Oil Co., Boise, Idaho.

Officers Elected By Fan Manufacturers Group

OFFICERS for the ensuing year were elected at the 32nd annual meeting of the National Association of Fan Manufacturers, Detroit 2, Mich. Named were: President, Edgar F. Wendt, president, Buffalo Forge Co., Buffalo, N. Y.; Vice-president, R. A. Wasson, vice-president and general manager, Clarage Fan Co., Kalamazoo, Mich.; Secretary-treasurer, L. O. Monroe. The meeting was held at Hot Springs, Va., March 3 and 4.

Unit Heater Association Elects New Slate of Officers

CONVENING at Chicago, January 24, the Industrial Unit Heater Association, Detroit 2, Mich., at its 23rd annual meeting, elected officers for 1949, as follows: President, H. S. Wheller, president, L. J. Wing Mfg. Co., New York; Vice-



MOTOR PRICES

COMPETITION AND COSTS DETERMINE PRICES

Keener competition is causing cheaper prices.
Today's lower prices may mean poorer quality.
Investigate price and quality before buying.
MD Oil Burner Motors, properly designed, and efficiently produced, give best quality and workmanship at competitive prices.

Write for description and quantity prices.

ELECTRIC MOTOR DEVELOPMENT COMPANY
WICKLIFFE, OHIO

Home-Heating Dealers . . .

Your Keys to greater PROFITS!

General Motors—the key to greater value—value which is recognized by users of automotive and household appliance products the world over!

Delco-Heat—the key to customer acceptance—acceptance of Delco automatic home-heating products for their quality and dependability!

These keys will *open doors for you*—the doors of homes that recognize value—that want only the finest in automatic heat!

And these keys are emblematic of the *greater profits* that can be yours with a General Motors Delco-Heat franchise:

1. You'll be selling dependable quality products that your prospects know and trust—a name that's a household word—a name that has always been synonymous with *value*.

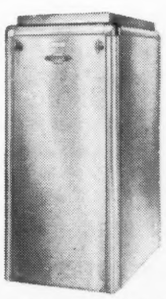
2. You'll be allied with a manufacturer whose research and engineering facilities will keep the products you sell *out in front*.

3. You'll have the help of a sales promotion program that really works—aggressive advertising and alert merchandising-helps that are geared to *meet your needs*.

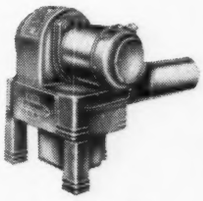
For full information concerning the many advantages of a General Motors Delco-Heat franchise, write to Delco Appliance Division, Dept. FO-4, General Motors Corp., Rochester 1, New York.

A Full Line of Automatic Heating Equipment

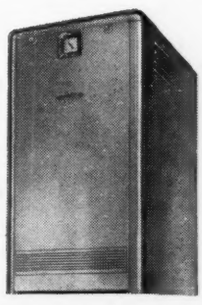
GENERAL MOTORS DELCO-HEAT



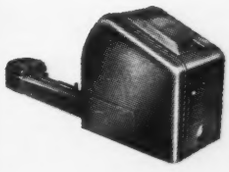
Oil and gas-fired Conditionairs



Conversion Oil Burners



Oil-Fired Boilers



Automatic Coal Stokers

Also manufacturers of Delco Water Systems for farms and homes — Fractional Horsepower Electric Motors — Electric Automobile Clocks.

president, L. D. Mandell, vice-president, C. A. Dunham Co., Chicago; Secretary-treasurer, L. O. Monroe.

Wisconsin Dealers Meet At Milwaukee Press Club

A REGULAR MEETING of the Wisconsin Oil-Heat Association, Inc., OHI chapter in Milwaukee, was held March 31 at the Milwaukee Press Club. Preceded by a dinner, the meeting heard a report from the committee who arranged the annual rally, held February 25, a progress report from the Home Show Committee, and reports from the legislative and advertising committees. In open meeting members discussed among other subjects the effect of the "coal miners' holiday," gas competition and every-day business problems.

A meeting of the board of directors was held prior to the dinner meeting.

Albany OHI Elects Three New Directors

OIL-HEAT INSTITUTE OF ALBANY, New York, elected three new directors at a March 9 meeting held at the Colonia Country Club. Designated were Arthur Main, Anthony Carpinello and Harvey Dwight. Mr. Dwight was named to complete the unexpired term of the late John E. Henry, the others being elected for full three year terms.

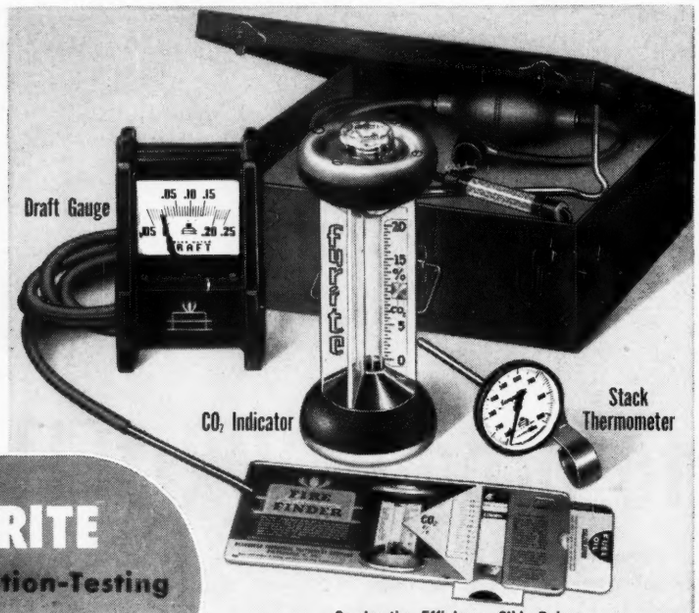
Propeller Fan Association Holds Election of Officers

THE TENTH ANNUAL MEETING of the Propeller Fan Manufacturers' Association, Detroit 2, Mich., was held at Atlanta, Ga., February 16-17. Among business matters concluded was the election of W. H. Holt as president, Lyman C. Reed as vice-president and L. O. Monroe, secretary-treasurer. Mr. Holt is manager, Fan Merchandise and Standard Apparatus Dept., Buffalo Forge Co., Buffalo, N. Y. and Mr. Reed is president, Reed Unit-Fans, Inc., New Orleans, La.

◈

NORGE-HEAT DIV., Borg-Warner Corp., Detroit, Mich., has issued a series of specifications sheets on five models of oilfired space heaters. Models HR392 and 942, HU950, HC955 and 965 are covered in separate sheets, each model pictured in conventional and cut-a-way views. The units are fired with 8, 10 and 13 in. natural draft burners, developing capacities from 32,000 to 65,000 Btu/hr. Dimensional data is shown for each.

THE COUPLINGS CO., Chicago 16, Ill., in catalog No. 1949CP lists its complete line of brass tube connectors for copper tubing. Flared tube, inverted flare, ball solderless and threaded sleeve type fittings are pictured, model numbers, sizes and prices included. Data are shown also for various types of drain and shut-off cocks, tubing cutter and flaring tool.



FYRITE
Combustion-Testing
MASTER KIT

Boosts Sales and Profits

Now, while your customers are totaling last season's heating costs, is the time to show them the inefficiencies of existing equipment by a dramatic "fuel-saving" test with the combustion-testing kit shown above. It's a cinch for closing new burner sales and getting profitable repair business.

Combustion-testing helps you make money in two ways. First, it boosts service profits because with instruments any service job can be done in less time and by less experienced men. Secondly, combustion testing is the only means to make sure that the burner is adjusted accurately when you leave the job, and this accurate adjustment means the end of needless call-backs which eats up the profits you made on the original installation.

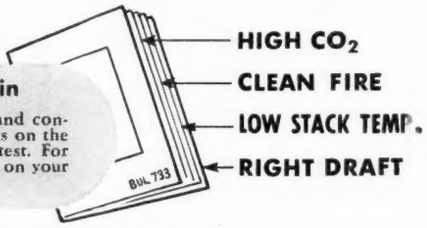
The Master Kit shown above is by far the most popular combustion-testing kit in the heating trade. It appeals particularly to those who want professional implements of highest quality and reliability, as well as of impressive display.

Dealer's price, $48.00. Other FYRITE Combustion-Testing Kits are priced from $36.50 up.

See the FYRITE Kits and our many other Service Instruments at your Jobber.

Send Now for Free Bulletin

Bulletin 733 describes the Master Kit and contains information of every day usefulness on the four important steps of a combustion test. For your free copy, tear this clipping, paste on your letterhead and mail *today*.



BACHARACH INDUSTRIAL INSTRUMENT CO., 7000 Bennett St., Pittsburgh 8, Pa.

These *Extra* Performance Features are Yours with

"Magic Pilot"

THERMO HOT WATER HEATER CONTROLS

A-P Model 240-WYX Thermo Water Heater Control, with exclusive "Magic Pilot" feature. Adjusting range from 125° to 155°. Simple to install.

• Steadier hot water temperatures • Lower fuel consumption • Sub-low pilot fire control • Snap-action high-fire control • Steadier, more accurate fuel flow

. . . They all add up to easier selling, assured customer satisfaction that helps keep your vaporizing oil burning hot water heater ahead in every market.

Write today for details on the A-P "MAGIC PILOT" Thermo Hot Water Heater Controls — and other modern Oil Controls that demonstrate greater oil flow accuracy on all your vaporizing oil burning appliances. A large and experienced staff of A-P research and designing engineers is always at your call for ready aid in perfecting your latest oil heating developments. Add A-P Dependability to *your* new products — for market success.

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DEPENDABLE *Oil Controls*

DESIGNED TO ELIMINATE SERVICING

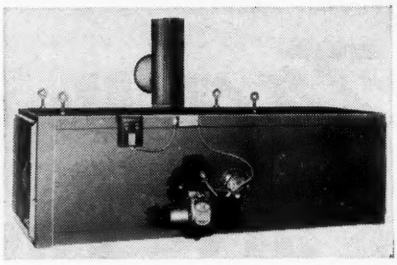
fuel oil / oil heat

New Products

Two Models of JC Ceiling Suspended Units

JACKSON & CHURCH CO., Saginaw, Mich., is offering a line of oilfired ceiling-suspended furnace units, with capacity range from 112,000 to 400,000 Btu. Model OL-180-S is the first of the units announced and OL-280-S was introduced shortly thereafter. The units are packaged to include casing, heater, blower, motor, filters and wiring harness. Overall dimensions are 23" by 27" by 74", with an additional 13" in width required for the stack.

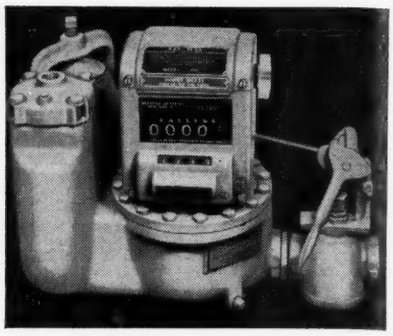
Eyebolts are installed at four points to facilitate suspension where this type



of hanging is feasible. Standard equipment includes pressure type oilburner, combustion chamber, fan and limit control, thermostat, barometric damper, primary control, with electronic controls available. Controls, combustion chamber and burner are shipped as separate items.

Red Seal Announces Four Types of New Registers

FOUR TYPES of new registers, adaptable to any Red Seal meters from 1¼" up on tank trucks and bulk plants, have been announced by Neptune Meter Co., New York 20, N. Y. Resetting and ticket printing is done simultaneously by one handle. Simplest type of the series 400 registers is the direct reading reset counter, with totalizer. The second type adds the Auto-Stop feature, providing auto-



matic deliveries and the third is the Print-O-Meter, furnishing a printed receipt showing gallons delivered. The fourth type combines the Auto-Stop and Print-O-Meter features (illustrated).

For a typical fuel delivery, the operator inserts a ticket, resets the meter thereby printing a row of zeros on the ticket and locking it in the register. Auto-Step setting then is made, which stops the delivery automatically when the pre-set gallonage has been metered. When this occurs, turning back the knob prints the amount delivered on the ticket and releases it.

The 400 series are incorporated in the Neptune unit replacement plan, whereby any basic unit of the meter can be

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***did all these* BOILERS**
Come from?
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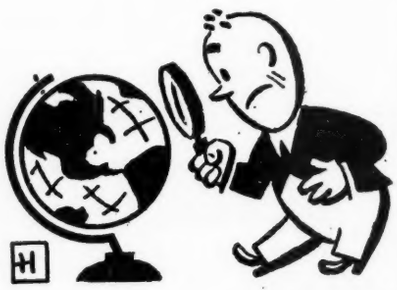
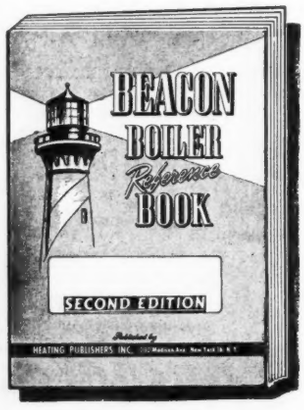
gives facts on more than 10,000





$3

THIS second edition contains ratings and major specifications of boilers old and new. Complete, comprehensive. More than 5,000 boiler trade names. More than 250 makes.

Handy size 8 x 11. More than 200 pages.

Seven years ago we labored over the first BEACON BOILER BOOK. That edition sold out rapidly. The war and the postwar confusion upset our plans to bring out a revised and up-to-date edition.

This second, latest one contains more data and is made up in a handier size. It contains ratings on domestic-heating boilers up to 2000 square feet.

All ratings are taken from the MANUFACTURERS' own statements of specifications and technical information.

For Makes You Never Heard Of, But Ones You'll Meet Someday.

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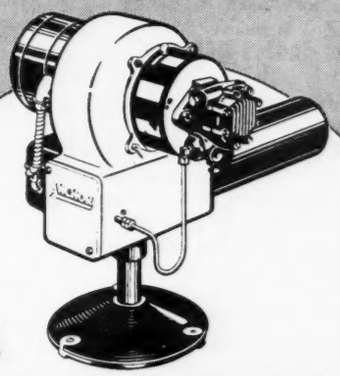

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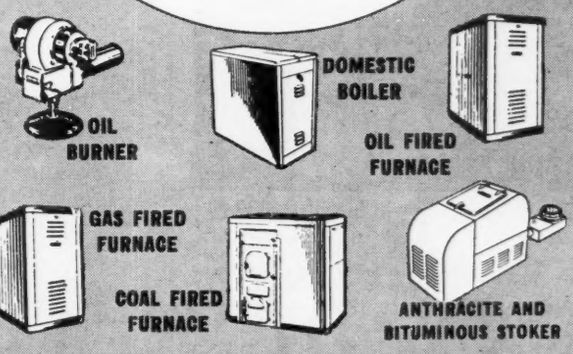


ANCHOR
"America's Finest Heating Equipment"

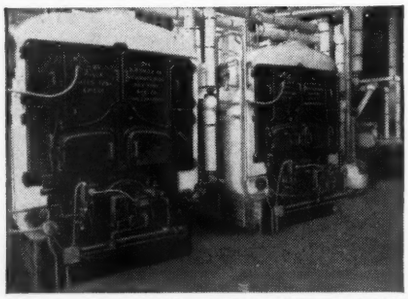
How to heat almost an acre of hangar

Heating the mammoth General Electric flight test hangar at Schenectady, N. Y., presented — as it always does in buildings of this type — the serious problem of how to maintain reasonably uniform temperatures despite very high ceilings and frequent air changes due to the opening and closing of hangar doors.

Consulting Engineer J. L. Ottenheimer solved the problem by specifying a radiant heating system installed in the concrete floor to maintain a comfortable temperature which is recovered unusually fast after hangar doors have been open. In spite of the 45-foot ceiling, a breathline temperature of only 60° has proved comfortable, and ceiling temperature is actually 2° lower, representing a considerable saving in fuel.

Two H. B. Smith No. 440 cast-iron sectional boilers heat the radiant floor panels in a manner which engineers have come to expect from these proved and tested Smith products. Their efficiency with heavy-oil, flexibility, and economy contribute much to any heating system. Their negligible maintenance costs, easy installation, and long-life expectancy should be considered no matter what the size of the job.

H. B. Smith boilers are being selected more and more for the difficult heating jobs where only the *best* equipment will do. The H. B. Smith Co., Inc., 68 Main Street, Westfield, Mass.



Two H. B. Smith No. 440 Mills water tube boilers, fired by heavy-oil burners, furnish steam for the heat exchanger from which water is circulated to the panels.

H. B. Smith

CAST-IRON BOILERS

Offices and Representatives in Principal Cities

exchanged for a guaranteed factory-rebuilt unit without removing the meter from the line. The new models are lighter in weight, save 2″ in the required height for installation and can be calibrated easily.

Silent Glow Invader Is Popular Priced Model

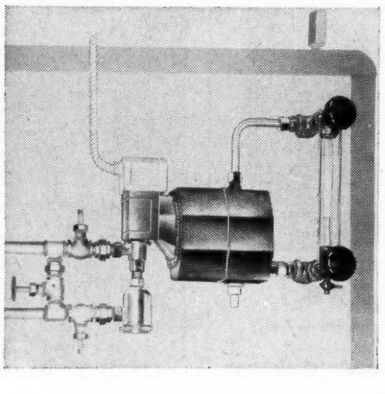
INVADER pressure atomizing type conversion burners, offered by Silent Glow Oil Burner Corp., Hartford 6, Conn. at a popular price in lots of five, are shipped complete with three Silent Glow controls and nozzle. Two capacities are available, one model operating in the range from 1.0 to 1.65 gph, the other from 2.0 to 3.0 gph.

Available with standard gun tube only, the Invader features a one piece time saver top, removable with a screw driver to expose all working parts of the burner. Other features include an external adjustment, bellows-operated pressure regulating valve, chrome steel electrodes and ability to operate efficiently on 100% catalytically-cracked fueloils when fired at the prescribed gallonage. Invaders are built in accordance with Commercial Standards CS75-39.

Maid-O'-Mist Boiler Controls Include Feeders and Cut-Offs

A COMPLETE LINE of boiler water feeders and low water cut-offs for low pressure steam boilers has been announced by Maid-O'-Mist, Inc., Chicago 41, Ill. The 500 series is compact, light in weight and built entirely of brass and copper. All units are shipped complete with built-in blow-off valve, strainer and quick hook-up fittings, and feature a new type of switch, used in the cut-off as a circuit breaker.

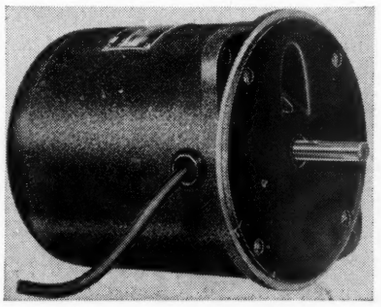
No. 577 Water-Boy combination feeder and cut-off, illustrated, is designed for automatically fired low pressure steam boilers up to 5000 sq. ft. capacity, 25 lbs. maximum steam pressure. No. 567 is a feeder only and No. 568 combines a feeder and low water signal.



No. 587 Boilergard low water cut-off, another in the series, is designed for steam boilers, automatically fired, 25 lbs. maximum steam pressure, and No. 857 feeder is for application to steam boilers, 15 lbs. maximum pressure.

Emerson Oilburner Motor With Built-in Thermal Protector

A NEW 1/6 hp single phase, split-phase motor, announced recently by Emerson Electric Mfg. Co., St. Louis 21, Mo., has



been designed for oilburner service and can be furnished for either clockwise or counter-clockwise rotation. Operating at 1725 rpm, the motors are streamlined to blend with burner design and manufactured to meet NEMA standards in mounting dimensions and performance.

Motors are totally enclosed for protection against moisture and dirt and are equipped with a built-in Klixon thermal protector with manual reset. Clevite bearings, oversize oil reservoirs, positive action actuator and starting switch and dynamically balanced rotor also feature the motors which are made for 115 volt, 60 cycle current.

G.E. Introduces New Ignition Transformers

A NEW LINE of four standardized ignition transformers for domestic oilburners has been announced by General Electric's Specialty Transformer and Ballast Divisions. Bulletin GEA-5273, available from the Apparatus Dept., Schenectady, N. Y., describes the new models, available in medium and small case sizes.

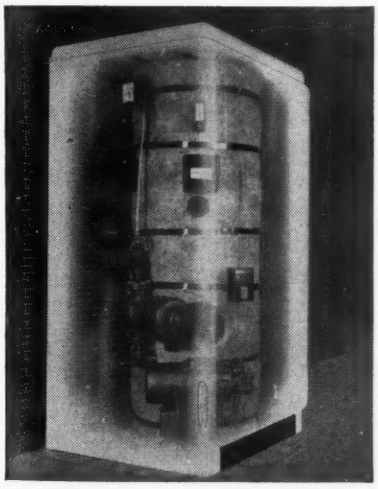
Equipped with built-in two-way self-shielding for radio interference suppression, models can be furnished for single-slot end mounting or for concealed mounting in both case sizes. High volt-

age bushings and low voltage junction boxes are located at the same end of the transformer to facilitate maintenance, with a steel junction box partition protecting the low voltage coils.

York Oilfired Boiler Unit With White Enamel Jacket

FEATURING a baked white enamel cabinet for kitchen installation, model PB9-300RL oilfired boiler-burner unit, has been developed by York-Shipley, Inc., York, Pa. Originally designed for installation in Levitt homes on Long Island, N. Y., the unit provides low temperature water for radiant heating, has a large tankless heater for domestic water and incorporates an air expansion tank inside the boiler. Intended primarily for radiant heating applications, the boiler can be used with all types of hot water heating.

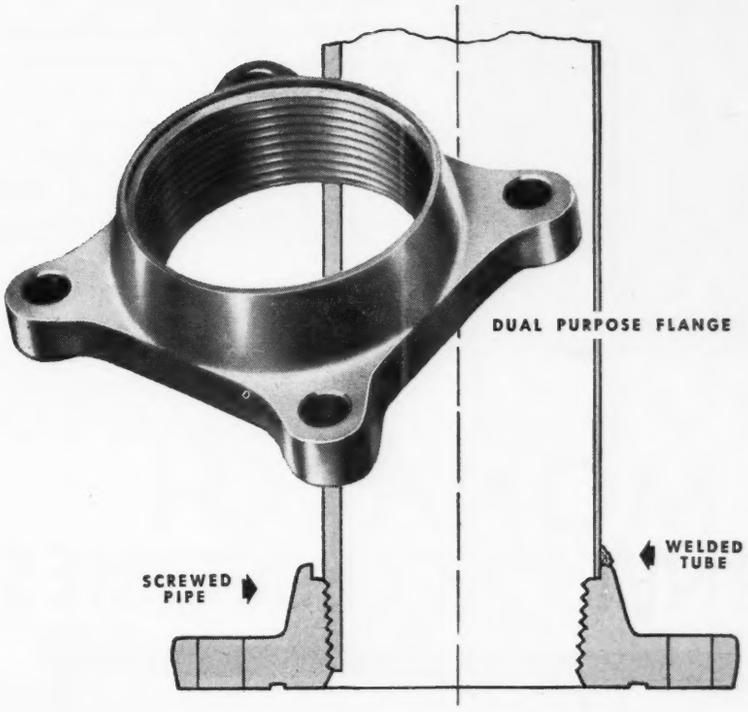
Measuring only 36″ wide, 65″ high



and 32″ deep and resembling a modern refrigerator in appearance, the unit is offered to builders as a means of cutting costs by elimination of the utility room. Quiet operation has been achieved through selection of low noise level component parts, it is reported, and by using sound insulation in the sides of the cabinet.

Delta Floor Furnace Rated At 50,000 Btu Output

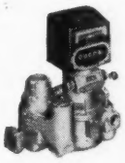
A FLOOR FURNACE, distributed nationally by Delta Heating Corp., Jackson Heights, N. Y., is rated at 50,000 Btu output and features a 24″ steel floor grille. Installation is normally possible by cutting only one floor beam. A forced draft booster is employed to provide combustion air for the unit, whose in-



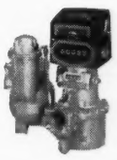
For **WELDED TRUCK PIPING**

Smith Truck Meters are now furnished with forged steel flanges

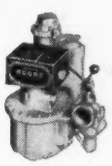
In step with the growing trend toward welded tubing for tank truck piping, Smith Meters are now furnished with forged steel flanges instead of cast iron. Installations may now be made with tubing welded directly to flanges or with screwed pipe connections at users' option. Forged steel flanges are but one of many advantages of Smith Meters — famous for fast, accurate service and for "Unitized Design" which permits tailor-made installations.



T-6



T-10



T-15

Illustrated Left Above: One and one half inch T-6, 60 GPM, inlet 1½″ pipe or 2″ OD tubing. Center: Two inch T-10, 100 GPM, inlet 2½″ pipe or 3″ OD tubing. Below: Three inch T-15, 150 GPM, inlet 3″ pipe or 3½″ OD tubing.

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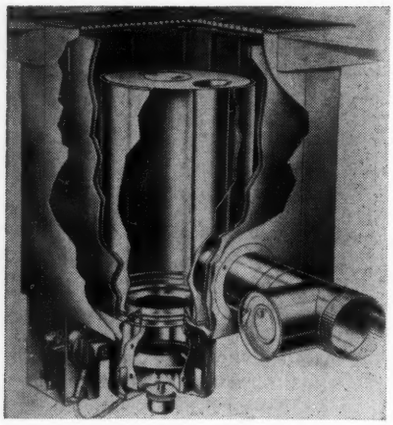


side liners are 28 gauge galvanized steel and outside casing 24 gauge.

Operating controls for the furnace are assembled at the factory and mounted directly under a removable cover at the side of the floor grating. The unit is equipped with a high limit thermostat and has cold air return double baffled to prevent expansion noises.

Seidelhuber Oil Boiler Incorporates Steel Coil

AN OILFIRED flash boiler, designed for domestic radiant heating with hot water,

is being produced by Seidelhuber Iron & Bronze Works, Inc., Seattle 44, Wash., in three sizes. Model A-100 is rated at 110,000 Btu/hr output, A-150 develops 169,000 Btu and A-200, 220,000 Btu. The units feature a steel firebox ring, lined with refractory fire brick, factory installed before shipment. The jacket also is pre-installed and need never be removed. When service work or cleaning is necessary, parts are accessible through the removable jacket top.

Standard steel pipe, 1¼" in diameter, is used for the boiler coil, installed directly above the firebox, with a stainless steel shield protecting the lower pipe coils from intense firebox heat. The boiler coil can be removed readily by loosening two connections. Stack bottom and rear of the unit induces heat travel up the coil center and down the outside.

Breathe-O-Stat Pulls Air Through Thermostat

PATENTS are pending on Breathe-O-Stat, a device, developed by McLarty Systems, Battle Creek, Mich., designed to make thermostats compensate automatically for warm, cold or windy weather. It consists of an anticipation type thermostat and a tube which leads from the control to the chimney flue. The tube causes a draft to flow through the thermostat, drawing an air sample directly over the control mechanism.

The effect of the draft is explained as compensating for outside conditions as well as room temperatures. As the outside temperature drops, or wind velocity increases, the draft increases proportionately and the amount of draft in turn regulates the length of the firing periods. McLarty is now in production on the device and cites tests to show an 8% saving on oilfired installations.

MONARCH BURNER ACCESSORIES

THE NEW COMBUSTION HEAD

The Monarch G-74 Head embodies an entirely new approach to efficient means for intimately mixing air with atomized oil to provide a highly efficient controlled flame.

Note these features:

1. Suitable for capacity sizes from .75 GPH to 2.50 GPH.
2. Simple to install and has no external "adjustment" to juggle and there is no "guess work" about the settings.
3. Price—Less than the cost of a good fuel unit.

Atomizing Nozzles

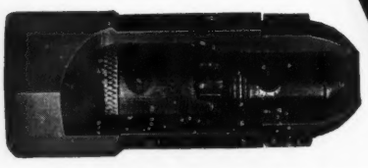
Preferred Because:

1. Each nozzle is individually tested and checked for capacity against the flow of a calibrated master sample. Capacity tolerances are as low as plus or minus 2½%.
2. Standard nozzles will fire most gun type high pressure burners satisfactorily, but special series are also available for burners requiring specified spray characteristics.

Send for Circular #1749

Replacement Valves

Monarch piston type pressure regulating and cut-off valves are available in several models to suit most replacement needs. G-49 valves can be mounted in any position and piston will not jam from dirt. Contain no bellows or diaphragm to break or corrode.



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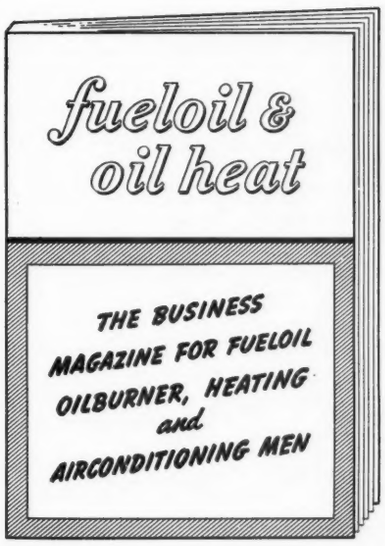

It is our official issue for the 26th Annual National Oil Heat Exposition and Convention, Boston, May 16-20. Readers will find it a source of complete information on this greatest event of the oilheating year.

ADVERTISERS will get the usual good values of every issue, plus added coverage and reader attention.

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1948 Exports Much Lower Due to Dollar Scarcity

EXPORTS OF domestic oilburners and units in 1948 dropped more than 87% from 1947, the industry's peak year. The principal reason was inability of foreign countries to get dollar exchange for products other than barest necessities. A minor reason was that postwar recovery had progressed in some countries to the point where they could start making their own burners. Then the world oil shortage last year caused some countries to forbid installation of oilburners temporarily.

The most significant declines were in shipments to Canada, from 22,185 in 1947 to 1,123 last year, or 95%, and Sweden from 13,552 to 34, or more than 99%.

Some 13% of all domestic burner and unit exports, or 948, went to countries in Northern Europe by virtue of ECA, or the Marshall Plan. Yet the five countries so benefited had bought on their own some 15,750 burners in 1947.

Industrial burner exports were off 80%, from 22,849 in 1947 to 4,815 in 1948, and shipments of parts for both domestic and industrial burners dropped 71%, from $3,758,144 to $1,078,190.

1948 Oilburner Exports by Countries

COUNTRY	*Domestic Conversion Oilburners and Oilfired Boilers* Units	Value	*Industrial Conversion Oilburners and Oilfired Boilers* Units	Value	*Parts for Burners Domestic and Industrial* Value
Canada	1,123	$50,598	803	$ 165,326	$ 345,948
Newf. & Labr.	51	9,041	31	8,169	7,395
Mexico	452	77,014	579	219,872	67,241
Guatemala	36	7,309	12	10,366	822
Bermuda	44	4,325	4	581	1,496
Cuba	129	17,955	135	121,530	28,319
Colombia	115	7,065	103	68,519	7,853
Venezuela	195	32,177	151	84,203	36,723
Ecuador	16	1,143	11	5,118	..
Chile	99	20,966	53	28,278	18,237
Brazil	110	24,317	225	169,667	28,426
Uruguay	344	61,710	327	179,366	17,477
Argentina	105	22,051	441	229,346	26,005
Iceland (ECA)	159	29,368	21	9,044	439
Sweden (ECA)	34	7,020	77	39,197	67,201
Norway (ECA)	66	13,393	172	15,997	31,612
Denmark (ECA)	108	804	..	..	2,299
United Kingdom (ECA)	8	1,266	17	2,686	14,054
Eire (ECA)	573	29,982	5	6,048	4,724
Netherlands	269	47,496	222	109,456	30,011
France	44	6,772	59	17,704	11,593
Belgium & Lux.	718	102,644	104	27,410	58,862
Switzerland	1,043	128,633	110	21,014	56,082
Finland	490	92,350	48	27,793	14,941
Portugal	192	26,734	55	27,549	14,813
Greece	82	18,461	75	77,785	25,111
Turkey	23	3,524	11	16,286	609
Lebanon	77	15,290	132	16,180	412
Iran	143	25,347	5	847	1,214
Palestine	19	3,104	2	2,275	..
India	18	3,908	15	3,511	..
Philippines	72	3,937	32	27,301	2,356
China	127	14,549	37	32,340	1,640
Japan	30	9,371	..	..	..
New Zealand	80	13,027	..	..	6,178
Tunisia	10	1,428	28	4,517	1,050
Egypt	54	7,862	4	928	747
Un. of So. Africa	46	5,449	43	8,266	11,724
So. Rhodesia	16	2,517	..	..	493
Other Countries	75	17,168	666	144,215	134,083
TOTAL	7,454	969,971	4,815	1,928,690	1,078,190

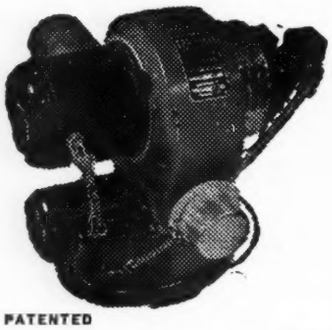
SOURCE: Consumers Merchandise Branch, Office of International Trade, Department of Commerce.

United States Exports by Years

DOMESTIC AND INDUSTRIAL CONVERSION OILBURNERS AND OILFIRED BOILERS: AND PARTS 1932-48

YEAR	*Domestic Conversion Oilburners and Oilfired Boilers* Units	Value	*Industrial Conversion Oilburners and Oilfired Boilers* Units	Value	*Parts for Burners Domestic and Industrial* Value
1932	3,826	$ 659,183	1,574	$ 259,142	$ 171,755
1933	3,593	555,132	1,701	269,446	315,868
1934	3,502	581,650	1,393	228,927	284,796
1935	4,082	576,855	1,847	196,656	234,917
1936	4,648	623,822	1,027	182,955	401,902
1937	6,329	788,930	1,440	239,317	277,401
1938	5,746	700,112	1,407	208,116	217,765
1939	4,990	544,102	2,290	298,531	242,478
1940	2,969	348,374	1,812	246,056	243,445
1941	2,143	201,599	1,662	250,906	332,322
1942	926	87,992	1,729	211,838	139,814
1943	707	67,533	1,103	220,085	238,677
1944	747	77,640	1,507	275,904	366,621
1945	6,770	494,830	3,326	747,663	1,056,848
1946	40,912	2,349,512	6,489	1,258,566	1,933,194
1947	58,698	7,141,113	22,849	5,006,639	3,758,144
1948	7,454	969,971	4,815	1,928,690	1,078,190

CUT FUEL COST NOW



PATENTED

WITH THE NEW
TRU-HEET
OIL BURNER

Equipped with
SHELL DEVELOPMENT CO.
COMBUSTION HEAD

Also
Many Other New Features

- CO_2 high as 15%—no smoke
- Fuel savings high as 30% and over
- Oil rate 0.50 to 10.00 G.P.H.
- Thousands of proven installations, since 1945

Also Boiler & Warm Air Units

Direct your inquiries to

TRU-HEET COMPANY
542 MILLER AVE.
TRENTON 10, N. J.

Manufacturers of Fine Oil Burners
Since 1928.

It pays to buy a good tool . . .
It pays to buy a

KENT

DOUBLE SUCTION Furnace Cleaner

Long life with fewer breakdowns! You can depend on KENT design, quality, and workmanship to do the job you want, when you want it done!

KENT Features

- No outside dust bag!
- No soot passes thru fans!
- 2 fans—powerful suction, less r.p.m.!
- Strong, yet light—easy to carry!
- Easy to empty dust bag!
- Rugged—built to last!

KENT will be at the
NATIONAL OIL HEAT EXPOSITION
Booth 371 Mechanics' Hall
Boston, Mass., May 16-20

It will pay you to see the KENT before you buy!

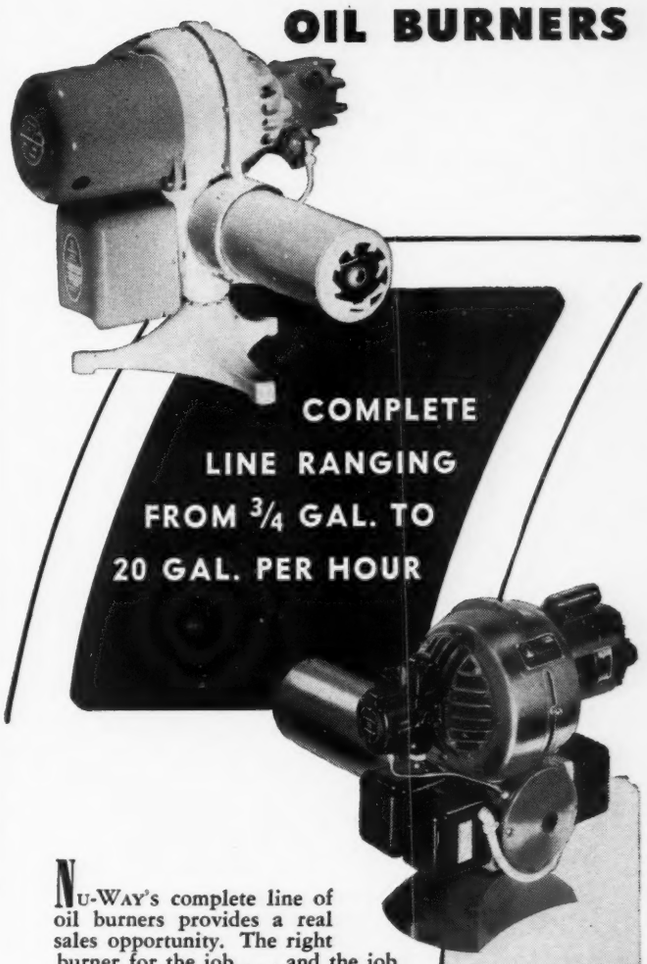
THE KENT COMPANY, INC.

434 CANAL STREET • ROME, N. Y.

Representatives in Principal Cities

Nu-Way

OIL BURNERS



COMPLETE LINE RANGING FROM 3/4 GAL. TO 20 GAL. PER HOUR

NU-WAY'S complete line of oil burners provides a real sales opportunity. The right burner for the job . . . and the job can be sold . . . the profit made. With sizes from 3/4 gal. per hour up to 20 gal. per hour, Nu-Way Oil Burners effectively handle a wide range of installations. And, Nu-Way's exclusive patented features are real sales getters. Only Nu-Way has positive Air Control and Shielded Nozzles for top efficiency and real economy. Nu-Way's shielded nozzle provides for burning a smaller quantity of fuel oil with increased efficiency . . . ideal for small homes.

Demand for Nu-Way Oil Burners is constantly being stimulated by a regular schedule of advertising in national home magazines. A whole array of local sales helps including mats, folders, booklets, displays, etc., are available to dealers handling Nu-Way equipment.

Get information on the profit line . . . Nu-Way Oil Burners. Write today.

Nu-Way
OIL HEATING EQUIPMENT

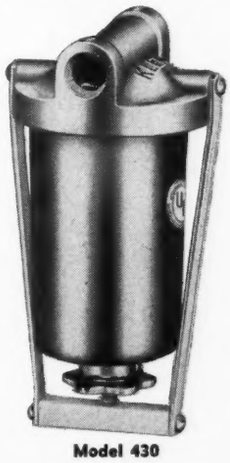
THE Nu-Way CORPORATION

Rock Island, Illinois
Serving Distributors, Furnace and Boiler Manufacturers
"Automatic Oil Heat Exclusively Since 1921"

CASH IN ON

QUICK TURNOVER STEADY PROFIT

with Klemm Fuel Oil Filters



Model 430

Oil users are quick to see the advantages when you show them the Chemistone filtering unit. Only Klemm has it and only Chemistone does the best filtering job. Traps water, dirt, sediment and any other foreign material. You profit by a good margin on each sale and increased customer goodwill. Model 430 metal bowel, listed by Underwriters' Laboratories, Inc., also available with glass bowel.

Klemm

AUTOMOTIVE PRODUCTS COMPANY

1718 N. Damen Avenue **Chicago 47, Illinois**

Manufacturers Activities

Green Establishes Research Division

A NEWLY CREATED division of research and engineering, established by A. P. Green Fire Brick Co., Mexico, Mo., consolidates all research and engineering functions, with the exception of sales engineering. The division is under the direction of R. S. Bradley, with A. R. Lesar heading the research engineering section, W. D. Clark in charge of industrial engineering and J. C. Potts supervising the plant engineering section.

Mr. Bradley, with the company since 1931, had been director of research before his promotion.

Timken Names Managers; Holds Week-Long Meeting

APPOINTMENT of one new regional manager and seven district sales managers by Timken Silent Automatic Div., Timken-Detroit Axle Co., Jackson, Mich., has been announced as a step to accomplish closer sales cooperation with its dealers. The new regional manager is T. O. Lawler, in charge of the territory embracing Ohio, West Virginia, Indiana, Kentucky and Tennessee. District sales managers and their territories are: John A. Pratt, Maine; John J. Morro, western Connecticut and western Massachusetts; Hanford Gruher, New Jersey; E. M. Cahill, Illinois; F. H. Huber, Iowa, Missouri and Nebraska; Wilbur W. Gregg, Michigan; Robert S. Daniels, Kentucky, Ohio and West Virginia.

A recent week-long meeting of management personnel and twenty managers of sales regions and districts, held at the factory, featured analysis and discussion of sales prospects and objectives for 1949. T. A. Crawford, general manager, was chairman of the meeting and delivered the keynote address. Other talks were given by Walter F. Rockwell, president, Timken-Detroit; C. A. Cooper, assistant general manager, R. M. Marberry, advertising manager and W. J. Chappell, assistant sales manager, Timken Silent Automatic. In coordinating field sales activities on coal, gas and oilheating equipment, special attention was given to production outlook, dealer relations, advertising and promotion, service and mechanic training. Another highlight witnessed presentation of the new "Duty-Designed" small home heating line, including Hi-boilers and furnaces and a new oil boiler for kitchen installation.

New Timken appointees pictures are: Standing, F. H. Huber, Robert S. Daniels, Wilbur W. Gregg, E. M. Cahill. Seated: Hanford Gruher, John A. Pratt and John J. Morro.

Consolidate Manufacture Of Norge-Heat Equipment

A DECISION to consolidate manufacture of warm air home heating products in

Solenoid
STAINLESS STEEL
Valves

ACTUAL SIZE

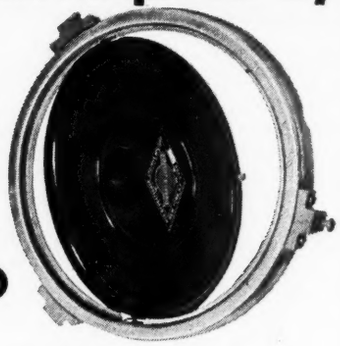
★ Standard pressure range, 5 to 250 psi
★ Dimensions 2¾" high x 1⅝" dia.
★ Impregnated coils withstand moisture and condensation
★ Soft insert seats prevent leakage
★ Spring loaded for positive action
★ Stainless steel parts highly resistant to corrosion and wear
★ Power consumption 10 watts max.
★ Pipe connections to specification
★ Also many special valves for handling pressures from 5 to 850 psi

THREE WAY - TWO POSITION
TWO WAY - NORMALLY CLOSED
TWO WAY - NORMALLY OPEN

Skinner will be pleased to make recommendations on your particular design applications — they have for hundreds of others. Write today for details and catalog.

SKINNER ELECTRIC VALVES
Skinner ELECTRIC VALVE DIV.
THE SKINNER CHUCK COMPANY
137 Belden Ave., Norwalk, Conn.

PREFERRED
DRAFT-A-JUSTORS
Cut Fuel Consumption by
10% TO 30%



The *Preferred* Draft-A-Justor is the original, patented Draft-A-Justor . . . improved to include the latest in engineering developments.

Stainless steel bearings and weather resistant metals provide long-life service without breakdown due to rust or wear . . . assure *continuous* fuel savings.

Millions now in satisfactory use.

WRITE FOR DESCRIPTIVE LITERATURE AND TRADE PRICES.

SIZES
Store, domestic and commercial sizes from 4" to 24" in diameter.
Industrial sizes from 2' x 2' to 5' x 12'.

PREFERRED UTILITIES MFG. CORP.
1860 Broadway, New York 23, N. Y. Boston Office: 839 Beacon St.

plants at Kalamazoo, Mich. and Ellwood City, Pa., was revealed recently by Howard E. Blood, president, Norge-Heat Div., Borg-Warner Corp., Detroit, Mich. The consolidation will enable the company to expedite service to customers and, in particular, the use of the factory in western Pennsylvania will afford quicker access to the eastern market. In the process the division's plant at Hammond, Ind. will be closed.

Mr. Blood announced also the intended expansion of the Norge-Heat line and inclusion of a new line of gas fired furnace units.

A-P Establishes Shops For Local Control Repairs

SPECIALIZING in reworking or recalibrating A-P oil controls and repairing thermostats, electric conversion tops and Oilifters used with oil heaters, service stations have been set up in many localities by Automatic Products Co., Milwaukee, Wis. The plan was initiated many months ago by Roy W. Johnson, A-P president and E. A. Vallee, vice president and general manager. The long range purpose was to provide "factory service in the field" for vaporizing oil-burners.

Identifying *sign for A-P service stations.*

Each station is staffed with factory-trained technicians, employing methods specified by the Automatic Products engineering department and each maintains a complete stock of repair parts and special tools needed to install them. A piece of major equipment is a test rack, consisting of four jacks with individual shut-off valves, adjusting leveling screws, spring mounting hooks, oil reservoir, filter, Oilifter, electric clock, viscosimeter, level and graduates. It is similar to test racks developed by A-P engineers for heater manufacturers who needed production checks of oil controls for Underwriters' Laboratories approval.

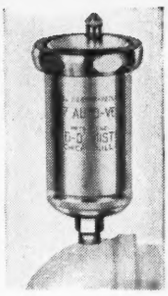
All service stations are listed in the business sections of local telephone directories and their shops are identified by signs reading: "Authorized A-P Oil Controls, Service and Repair."

Mor-Sun Financing Plan Includes Repurchase Agreement

TO PERMIT merchandisers to take advantage of quantity discounts more easily, Morrison Steel Products, Inc., Buffalo, N. Y., manufacturers of steel furnaces and truck service bodies, has instituted the Mor-Sun Plan for financing dealers' purchases. The proposal includes a repurchase agreement, guaranteeing local banks against losses in the event of default by the purchaser. As long as the equipment is new and undamaged the agreement guarantees full payment to the bank, providing risk-free financing for local banks, but leaves the bank free to exercise its discretion in granting loans to applicants.

Details of the plan are outlined in a 20-page brochure being forwarded to Morrison outlets, their local banks and other interested parties. Morrison's two advertising characters—"Sunny Mor-

STEP UP your circulation with AUTO-VENT Air Eliminators



Simple as A-B-C . . . yet positive in action every time! Sure-cure for air pockets and air traps that hold up the free circulation of water or other liquids flowing through pipes —pressures to 75 lbs. Simple in construction—easy to install!

Built of brass with self-closing float operated valve. Withstands high temperatures, oil and other adverse conditions. **Try these No. 7 Auto-Vents once, and you'll use them on every job. They're that good, yet NOT expensive.**

★ ★ ★

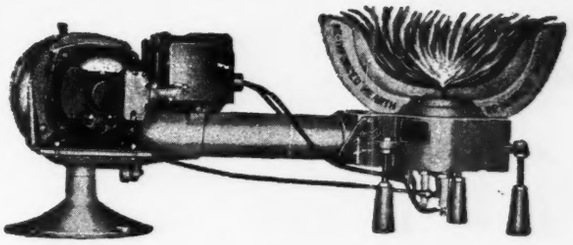
IT WILL PAY for you to have information and prices on the complete Maid-O'-Mist line which includes other types of air eliminators, and heating specialties. Write us today, or see your jobber!

HERE'S HOW TO VENT!
- Hot Water Heating Lines
- Hot Water— Convectors Unit Heaters Baseboards
- Cold Water Lines
- Coils, Tanks, Etc.

MAID-O'-MIST INC.
3221 N. PULASKI RD.
CHICAGO 41, ILLINOIS

AUTOMATIC HUMIDIFIERS
FOR ALL TYPES OF HEATING SYSTEMS

JACKSON OIL BURNER



The Greatest Seller!

Thousands of satisfied customers since 1939. Take notice for 1949.

It's the Jackson Horizontal Oil Burner. It's unconditionally guaranteed. It burns Oil at the Grate level, not in the Ash-Pit. It's a pressure type. It burns #3 Oil. It's easy to install, no Combustion Chamber to buy. It saves 15 to 25 per cent on Oil. It fulfills any Job, Domestic or Commercial.

A few valuable Franchise Territories open. Write us now.

NATIONAL DISTRIBUTOR

AMERICO ENGINEERING COMPANY
6791 JACKSON STREET BASELINE, MICHIGAN

Sun" and "Carrie-All"—guide the reader through various features of the plan. Contained in a pocket inside the rear cover is the wholesale repurchase agreement, sample of the trust receipt and literature on Morrison products.

Hall-Neal Dealers Meet In Indianapolis

TWO HUNDRED representatives attended a dealer sales conference conducted by the Hall-Neal Furnace Co., Indianapolis, Ind., held March 3 and 4 at the Marott Hotel, Indianapolis. Activities during the conference included an inspection of the Hall-Neal factory, including the new plant immediately behind the present building. The addition will double production of Victor furnaces during 1949. Three new models were introduced to the dealers—a new gas unit, Hi-Boy models for gas and oil and a heavy duty series for large installations for coal, gas or oilfiring.

Principal speakers at the morning and afternoon sessions included Fred S. Boone, president, who welcomed the dealers; Walter R. Stiles of the engineering department who discussed "Making the Survey," and Fred Gombert, sales manager, who offered "A Challenge for 1949." Other talks and discussions covered phases of merchandising, engineering and service.

Panelox Names Outlet; Announces Display Card

APPOINTMENT of J. Harvey Seat and Associates, Atlanta, Ga., as distributors of Panelox stainless steel combustion chambers, has been announced by Stefco Steel Co., Michigan City, Ind. The Seat organization is handling Panelox sales in Georgia, South Carolina, northern Florida and northern Alabama.

Stefco announces also a simulated flame display card to be placed inside the combustion chambers. The brightly-colored display piece is designed especially for use with the chambers when placed in counter displays.

Sundstrand Machine Names Seattle Representative

NAMING The Instrument Laboratory, Inc., Seattle 99, Wash., as representative for the sale of Sundstrand fuel units to oilburner manufacturers in Washington, Oregon, Idaho, Montana and Wyoming, has been announced by C. W. Lang, sales manager, Fuel Unit Div., Sundstrand Machine Tool Co., Rockford, Ill. These duties will be in addition to the Laboratory's present activity as a Sundstrand service station.

The company was begun in 1925 by L. R. Kettenring and he was joined in 1932 by his son, Don. In 1944 a Los Angeles branch office was opened and another established in 1948 in Portland. Instrument Laboratory employs approximately fifty people and specializes in repairing all types of instruments.

American-Standard Packages Dealer Merchandising Aids

A PORTFOLIO, opening and closing like an accordion, has been devised by American Radiator & Standard Sanitary Corp., Pittsburgh, Pa., to facilitate demonstration of dealer merchandising aids. Wholesale distributor salesmen have been furnished portfolios, containing eleven envelope pockets with actual samples of sales aids. Taking its theme from railroad terminology, the portfolios feature the slogan, "Here's the

FOR GREATER SAFETY
. . . CLEARER VISIBILITY
this Gauge wears a DOUBLE dome!
• Double Dome walls of clear plastic that is shock-proof and break-proof gives Sentry At-A-Glance tank gauges distinctive advantages. This patented feature will withstand air pressure in excess of 100 lbs. per sq. inch — Condensation will not cloud or affect its easy readability — It is guaranteed leakproof — and listed as standard by Underwriters' Laboratories. Write for details today. Investigate too, Sentry Draft Controls, for more efficient stack operation.
AT-A-GLANCE
TRADE MARK
OIL GAUGE
F
E
KRUEGER SENTRY GAUGE CO.
ON GUARD . . .
24 hours a day!
KRUEGER Sentry GAUGES
GREEN BAY • WISCONSIN

GLOBE Hot Water CIRCULATORS
QUIET! TESTED! GUARANTEED!
SAVE ON THIS
QUALITY-ENGINEERED CIRCULATOR
• Extra long, oil-impregnated bronze Bearings
• 1/6 hp. Westinghouse, or equivalent, Motor
• Patented, rotary-type carbon and bronze Water Seal
• Flexible Neoprene Coupling
Precision-engineered, tough, and rugged. The GLOBE Hot Water Circulator cost less than other circulators of comparable quality.
Manufacturers of Low Water Cut-Offs and Controls for a Quarter Century.
GLOBE CONTROLS CO.
81 WARREN ST. NEWARK 2, N. J.
EXCLUSIVE TERRITORIES AVAILABLE

ticket . . . Here's the line . . . to better business . . . in '49!" A miniature railroad ticket, patterned after the large portfolio, has been mailed to retailers.

Five new dealer helps featured are a room idea book, book matches, price cards, "Installed here" signs and a telechron clock for window displays. In a pocket devoted to direct mail the portfolio contains fifteen pieces of literature, with another pocket containing a copy of the American-Standard mat service.

Industrial Bank of Commerce Offers Summer Finance Plan

A SUMMER PLAN of "skip" method of installment payment for home improvement sales is being offered again by the Industrial Bank of Commerce, New York 17, N. Y., effective March 1. Repeating terms advanced in previous years, the plan can be used until September 30 for home improvements, including heating equipment.

The plan involves no recourse, 100% advance and no holdbacks, according to the bank's announcement. Other features preclude payment until November 1, no down payment and thirty-six full monthly payments, with no charge for the period between the completion of the work and November 1. After that, for the period of the note, a $5 per $100 per year rate applies.

Stamford Bank Display Features Petro Products

IN THE SECOND of a series of demonstrations planned to dramatize the importance of local industrial production to community prosperity, products and services of Petroleum Heat & Power Co., Stamford, Conn., are featured in a month-long exhibit on the banking floor of the Stamford Trust Co. Identifying Stamford as the "oilburner capital of the world," the exhibit emphasizes the world-wide use of Petro's oilburners in homes and industries.

Large photo murals show various phases of company operations, including research, refining and transportation activities, with various models of domestic and industrial oilburning units displayed. One of the panels in the exhibit recounts Petro's responsibilities to their employees, customers and stockholders and points out that since 1920 Petro has

James D. Burnes, vice president of Petro; James C. Shannon, former governor of Connecticut and Harold E. Rider, president Stamford Trust Co., look over the Petroleum Heat & Power Co. exhibit in the bank.

distributed millions of dollars in Stamford "For wages, taxes and for purchases of materials and services—with benefit to all segments of our community."

Wagner Electric Acquires Second Illinois Factory

A PLANT, consisting of industrial buildings containing 90,000 sq. ft. located on an eight acre tract at Mt. Vernon, Ill., has been purchased by Wagner Electric Corp., St. Louis, Mo. Transformer tanks will be built at the newly acquired plant, where cranes capable of handling large,

DO ALL SIX CORRECTLY!

DWYER TRANSPARENT COMBUSTION TEST SETS

1. Determine proper CO_2 content
2. Check for air leaks
3. Adjust air controls
4. Know draft conditions
5. Level burners and controls
6. Find stack temperature readings

DWYER Combustion Test Set includes CO_2 Indicator, Visi-Draft Gage and Level and Stack Thermometer... every instrument necessary to do these jobs ACCURATELY. Durable carrying case, all accessories and instructions.

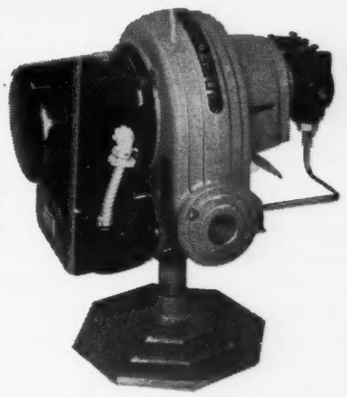
DWYER Bulletin 220 sent on request - Describes this set and other styles.

F. W. Dwyer Mfg. Co.

SELL Radiant OIL BURNERS

PROFIT
100,000 highly satisfactory installations *plus* constantly increasing contractor demand mean *more sales for you.*

QUALITY
Highest commercial standard underwriters' and F.H.A. specifications. All parts meet rigid inspection and exacting factory tests.



NEW ENGLAND REPRESENTATIVE
George H. Green
Park Square Building
Boston, Mass.
Phone: Liberty 2-6484

Warehouse servicing *entire* New England area and upstate New York.

Write *today* for full details on this outstanding, profitable oil burner.

NOTE: SEVERAL TERRITORIES AVAILABLE

RADIANT UTILITIES CORP.
8817 18th Avenue • Brooklyn 14, N. Y.

fuelfoil & oil heat

heavy items are installed. Early in 1948 another Illinois plant, located at Edwardsville, was purchased by Wagner and adapted to manufacturing air and hydraulic brakes.

Since the war additions to existing facilities and purchases of additional factories have almost doubled Wagner's manufacturing capacity. Products include electric motors, transformers, industrial and heavy automotive braking equipment.

Harvey Booklet Sells Preventive Service Parts

PREVENTIVE SERVICE by the replacement of oilburner parts before they actually fail is the theme of a new consumer booklet just released by Sid Harvey, Inc., Valley Stream, N. Y., "specialists in oilburner repair parts for the trade." Designed for use by the company's eleven outlets and its many distributors, the booklet explains in light, cartoon treatment the parts of the oilburner that can fail; the heart (pump), the brain (controls), and the muscle (motor). Its text urges the homeowner to replace these parts before they quit at the wrong time and create inconvenience or hardship.

An interesting comparison from the booklet is the likening of a 5-year-old oilburner to an automobile that has traveled 150,000 miles. It is calculated that a car runs 150,000 miles at 30 miles an hour in 5,000 hours. The domestic oilburner operates 1,000 hours a year (more if it supplies summer hot water) so in five years it is "old" by automobile standards.

Sid Harvey promotion in the booklet is confined to a brief statement that the firm specializes in rebuilt and remanufactured parts that are low in cost.

Albany Supply Firm Changes Corporate Name

ALBANY AUTOMATIC SUPPLY CO., INC., Albany, N. Y., is the new name of the Automatic Supply Co., parts and supplies distributors. Ely B. Schoendorf and Julius Cohen are listed as incorporators of the new concern.

Thermo-Products Now Selling Under Own Trade Name

PRO-THERM is the trade name under which Thermo-Products, Inc., North Judson, Ind., is merchandising a line including several types of oilburning floor furnaces with capacities up to 50,000 Btu, Hi-Boy and Lo-Boy vaporizing oil furnaces and two sizes of domestic oil-fired water heaters.

In the past the company has produced similar products for other manufacturers to be sold under private brand names. J. S. Cunningham is manager of the firm.

Syracuse Dealer's Campaign Featured Deferred Payments

UNDER A PLAN inaugurated recently by Carmen Supply Co., Syracuse, N. Y., oilheating equipment was offered for immediate installation in February, with no down payment and no payments required until June 1. Newspaper advertising launched the drive, featuring the caption, "Save $75 to $300 by installing your heating now." Advertisements carried a coupon with which prospects could request a Carmen representative to call.

The campaign, which was extended into the nearby towns of Cortland and Fulton, urged home owners to install in the off-season period, avoiding the sea-

Galongage

THE IDEAL GUAGE ... FOR BASEMENT TANKS!

CHECK THESE OUTSTANDING FEATURES

- Time and money saver—comes fully assembled.
- Accurate readings—measures in 10-gallon spacings.
- Precision built for years of service.
- Eye appeal and easy readability.
- Listed as approved by Underwriters' Laboratories.

When making replacements and checking oil burners for greater efficiency, install *Galongage.*

When ordering, specify depth of tank and size of opening.

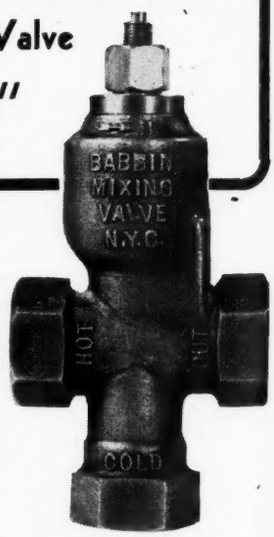
APPLIED MECHANICS COMPANY
167 OLIVER STREET, BOSTON 10, MASSACHUSETTS

INCREASE HOT WATER TANK CAPACITIES from 13 to 56%

with THE *New* BABBIN

Thermostatic Mixing Valve

3/4" — 2"



This BABBIN Valve brings fully dependable thermostatic hot water regulation to the small and large home field. It is adaptable for use on storage tanks, submerged tanks and tank saver units, and many other industrial and domestic applications.

- All Bronze Casting . . . "ADNIC" Corrosion-Resistant Thermostatic Unit
- Positive Hot and Cold Water Shut-off
- Temperature Range from 70° to 180° F. Only one moving part.

For complete details. Write today. DEPT. F

EXPANDING TYPE SOLID LIQUID FILLED PATENTS 2081728 2282152

Babbin M.Y.C. THERMOSTATIC CONTROLS

258-60 Canal St. New York

sonal rush which will come later. Financing was arranged over a full three year period.

Perfection Stove Names Six Additions to Sales Staff

ADDITION of six salesmen to its staff has been announced recently by Perfection Stove Co., Cleveland, Ohio. In the Jersey City, N. J. district Harry G. Horne and Robert J. McGeehan have been added. Mr. Horne has been employed as a salesman and Mr. McGeehan engaged to travel in Pennsylvania, with Lancaster, Pa., as his home town.

In the Chicago district, Albert D. Krause has been named to travel northeastern Indiana and southwestern Michigan and Leonard K. Pinkley, Jr., Murray, Ky., will contact Perfection dealers in that section.

Other appointments saw Bernard D. Willman added to the staff of the Kansas City district to cover the north central section of Kansas and Warren H. Gray, for the past year employed in the order department of the Cleveland district, transferred to the sales staff.

Toridheet Distributor Opens New Cleveland Establishment

A NEW PLANT, opened recently by Domestic Heat & Equipment Corp., Cleveland, Ohio, distributor for Cleveland Steel Products Corp., Cleveland, was designed expressly for customer convenience plus quick delivery of merchandise. Occupying a one acre tract on Cleveland's west side, ample parking space is provided on the property, with direct access to a large city desk for convenient pick-up of small merchandise and light equipment. At the rear of the building truck level loading platforms have been installed, and a spur facilitates receipt of incoming rail shipments.

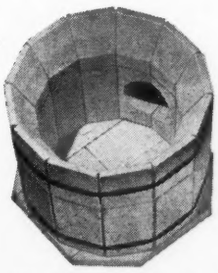
Fourteen thousand square feet of total space houses executive offices, sales and service rooms, large display space, engineering laboratories, warerooms and a sheet metal fabricating division.

◈

Vincent Vandervoort has been named vice president of Marlow Pumps, Ridgewood, N. J. A widely known New Jersey industrialist and banker, he has been affiliated with Marlow since 1947.

Harold Halsted Park, Katonah, N. Y., president and founder of H. H. Park, Inc., distributors of Gulf Oil products, was honored at a testimonial dinner on March 1 on the occasion of his 40th business anniversary. Sterling silver plates presented to Harry Oakley and Lars Pedersen, during the festivities, marked their completion of twenty-five years with the company. A similar plaque was given Mrs. Susan Tuttle in memory of her late husband, N. P. Tuttle, office manager of the company for twenty-five years. All of the forty employees, their wives and husbands who attended the dinner, received a copy of a booklet issued to commemorate Mr. Park's forty years of service.

Einhard Sarenpa and *S. W. Boharic* recently began their duties as district sales managers, U. S. Machine Corp., Lebanon, Ind. Mr. Sarenpa's territory includes western Minnesota, embracing the twin cities, and parts of North and South Dakota. Mr. Boharic is contacting and servicing Winkler heating equipment outlets in eastern North Carolina, central and southern Virginia.

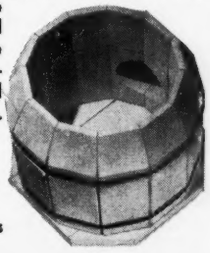


The *Instant-Glo*
CUSTOM-BUILT
INSULATING BRICK
COMBUSTION CHAMBER

The Top Quality Installation for Maximum Efficiency

INSTANT-GLO Combustion Chambers are made of special refractory insulating bricks which get hot 10 times faster than ordinary fire bricks insuring an instant red-hot refractory surface, resulting in immediate combustion efficiency—result, oil economy 15% greater than ordinary chambers. The insulating quality of the bricks also eliminates loss of heat into base of heater.

The round shape of INSTANT-GLO Chambers eliminates air pockets and produces less combustion noise than the usual fire brick chambers. Each part is taper cut like a keystone so that chamber can not fall in. The INSTANT-GLO Chamber can be installed in one hour or less. All components of each chamber carefully packed in special carton—no breakage or loss.



SIZES:
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Model 1A and 2A (*at right*) Special chambers for steel furnace installations.

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Write for free information today!

DOYLE VACUUM CLEANER CO.
233 Stevens St., S.W. Grand Rapids 7, Michigan

Oilheating Trends

(*Continued from page 11*)

SERVICE PLANNING: Asked about their service contract campaigns for this spring and summer, 87% of the reporting dealers are making such plans and 13% are not. Among all of those reporting, about one-fifth will offer service contracts including parts. The average contract price for this season, including parts will be $21.47, while the average contract price without parts is expected to be $17.61. This indicates a difference of a little under $4 which will obviously take care of the cost of supplying parts across the board on any representative number of accounts. Asked if any important companies in their markets were rendering burner service by adding its cost to the price of fueloil, 7% of those reporting say that this is being done to their knowledge, and 93% have not yet heard of it in their communities.

FUELOIL QUALITY: With fueloil much more plentiful than at any time since the war and with the major suppliers starting active sales campaigns it is reasonable to expect some quality improvement over the period when product was so scarce that everyone had to scrape the barrel. Among all reporting companies 32% say that they have noticed a definite improvement in the quality of fueloil over a year ago, while 68% have not. Asked about the A.P.I. gravity of the No. 2 or 3 fueloil they are now getting, the average is 33. This is considerably better than might have been expected since the new specifications promulgated by the Bureau of Standards last summer permit a gravity as low as 26. The typical prewar gravity was about 36, so it is obvious that under today's competitive conditions the character of fuels is better than might have been expected.

Asked whether there has been any reduction in the number of complaints about odor or nozzle clogging compared with last winter, 42% of the reporting dealers say that they are getting fewer complaints and 58% report no difference.

◈

F. J. Hood has been elected president, Ansul Chemical Co., Marinette, Wis., succeeding H. V. Higley, named chairman of the board of directors. The company offers a line of refrigeration chemicals and dry chemical fire extinguishers.

F. J. Van Poppelen has been appointed manager of manufacturing, General Electric Co., Air Conditioning Dept., Bloomfield, N. J. With more than thirty-five years association with G-E, Mr. Van Poppelen now takes up the duties as manufacturing consultant on the Air Conditioning Dept. Manufacturing Staff.

V. W. Blackney has been promoted to assistant to the president and *J. Roy Know* has advanced to general manager of sales, United States Radiator Corp., Detroit 13, Mich. Mr. Blackney, with U. S. since 1916, after several years in branch office work and in the production department became assistant general manager of sales and later director of sales. Mr. Knox, formerly manager of the Pittsburgh branch, joined U. S. in a sales promotion capacity. He became a salesman in 1934 and assistant branch manager in 1942.

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VIKING ROTARY PUMP

The sturdiness built into the Viking rotary pump is well illustrated in the Viking rotor and idler above. Their wide tooth form and slow operating speed result in efficient operation, with long, dependable service.

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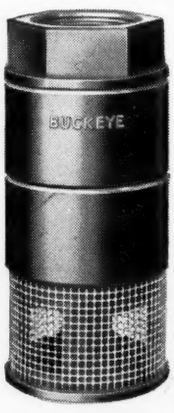
Oil men know this about Buckeye Oil Burner Accessories: That the name itself signifies quality, that accessories bearing this name can be installed and forgotten, that fine performance and long life are *built into* every Buckeye fitting. Here are a few selected from the Buckeye line:



← **No. 439 Foot Valve**
Double poppet. Seats, hand-lapped to disc for perfect accuracy, are the only moving parts. All brass construction. Full flow.

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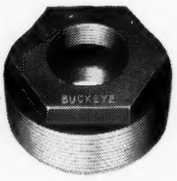
Single poppet. Retain accuracy after years of use. Full capacity for unrestricted flow.



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For oil burner installations, Buckeye also makes fill caps, fill boxes, vents, sludge pumps, strainers, check valves and shut-off valves.

BUCKEYE IRON & BRASS WORKS, Dept. F
P. O. Box 883, Dayton 1, Ohio

How to Figure Cfm

(*Continued from page 63*)

figuring and designing is all-important whether a quick, easy method is being used to obtain cfm figures, or a 99.9% accurate, scientist's method is being used. Actually, the best way for a newcomer to improve his judgment and gain confidence in his figuring is to design and install a few dozen winter air conditioning plants, then for the first heating season check in a modern, thorough manner on the performance of these plants. Instrument check-ups are invaluable for indicating whether or not the intended air flow is achieved in the systems. But since this road to good judgment and increased confidence usually is not open to students and newcomers to figuring, substitute methods must serve these men. One substitute is to have the newcomer's figures and plant designs checked by an old-timer at this type of work. Another substitute is for the newcomer to start at scratch designing, along lines parallel to those of the heating system being used, a heating plant for a home already being heated by a furnace-duct system. Knowing the results being given by the heating system, and checking the heating system performance with air flow instruments, the newcomer can compare the cfm figures he developed with the actual figures for the heating plant. The question of whether the new design would be better or worse in actual use than the existing heating system will be settled almost automatically by this comparison.

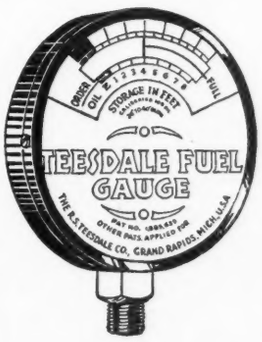
◈

C. G. Smith, formerly sales manager, has rejoined Davis Eng. Corp., Elizabeth 4, N. J., as sales promotion manager. R. Lisson continues as sales manager. Mr. Smith has served as sales manager for Simplex Oil Htg. Corp., New York, and in engineering capacities with naval and marine companies. His broad experience in the design and application of heat transfer products is to be applied to improve service to users of Paracoil equipment.

Wilson Davis, Orleans, Ind., has joined the sales staff of Perfection Stove Co., Cleveland, Ohio. He is a member of the company's Chicago sales district and will cover the southern Indiana territory. His previous experience includes three years as a factory representative for Adroit Tool & Eng. Co.

T. H. Banfield, president, Iron Fireman Mfg. Corp., Portland, Oregon, has been elected a member of the expanded board of directors of Stanford Research Institute, Palo Alto, Cal. The Institute is recognized as the center of applied research for western industry and its board represents a cross-section of western industrial leadership. Mr. Banfield was the only Oregonian elected.

T. Hollister Mabley has been appointed vice president and general manager, Mechanical Heat & Cold, Inc., Detroit 3, Mich., pioneer heating and air conditioning contractors. He will supervise Temp-Matic Wholesalers, its heating distributing organization and will serve also as treasurer of the company. Mr. Mabley joined Mechanical Heat & Cold in 1936 as chief engineer.



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Sets a new standard of Functional Beauty and Accuracy in remote control of room temperatures. This graceful, streamlined instrument extending only 1" from wall, has a stainless housing mounted on an ivory plastic base and lends enhancement to any scheme of room decoration.

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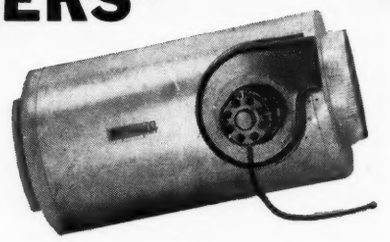

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Vaporizing Burners

(*Continued from page 60*)

It is well to know the shape of the flame a certain designed pot should produce and as there are but several types of flame shapes created by pot type burners, this provides no great difficulty. In addition to the sunflower and conical shaped flames provided by the pots mentioned above, there is another in the form of the horizontally projected conical flame as furnished by the retort shown in illustration No. 3. This burner has an interior vaporizing cup from which all vapors arise. As they leave the vaporizing cup, they are met by swirling streams of air and pushed at considerable velocity, after thoroughly mixing, to an opening at the front end of the horizontally placed pot. This projects a conical shaped flame in gun type burner fashion. The design of this retort provides for complete gasification within the burner proper and the movement of these gases after mixing with air and leaving the retort is of sufficient velocity to safely regard the opening provided by the combustion ring of this burner as being of the nature of a true gas jet.

The retort shown in illustration No. 5 provides a rectangular shaped flame that closely follows the contour of the pot. The only baffling provided by this pot is furnished by narrowing the opening at the top of the retort. This narrowed opening furnishes additional velocity to the air and oil burning above the pot.

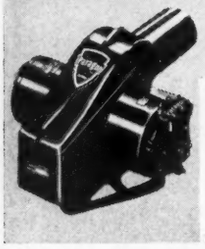
Any deviation from the normal flame shape and position expected from a specifically designed pot results usually from three conditions. 1) Improper air distribution which may result from the air inlet holes being clogged with soot or from insufficient draft. 2) Oil may be vaporizing too slowly either because it is too heavy or the pot is not heating properly. 3) The burner may not be level. There are a number of other mechanical causes of such trouble but these will be discussed at length in a future article.

Flame structures with pot type burners are progressive in nature. By this is meant that there is a gradual build up or progression to full flame size and of course the converse of this on the "off" cycle. With progressive combustion due to the gradual raising or lowering of flame formations, larger quantities of air than are usually needed at the start are provided. This is necessary in order to be certain that the necessary amount of air required for full firing will be present. Thus low starting CO_2's are to be expected and should not be regarded in such cases as any evidence of inefficiency. Such a condition is necessary to prevent the smoke and soot that would result from an oxygen deficient atmosphere. If a considerable amount of excess air seems to be furnished by a vaporizing burner as indicated by an extremely low starting CO_2, it must be remembered that this is deliberate and such air is required so that no initial cracking to soot in an oxygen deficient atmosphere may take place. With full fire, most vaporizing burners operate with a good CO_2 reading.

The essential difference to a vaporizing burner between a straight-run distillate and a catalytically cracked dis-

ONLY THE **Paragon Oil Burner** NONE BETTER

HAS THE NEW ***Paratrol*** COMBUSTION HEAD



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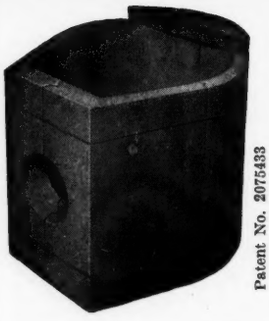

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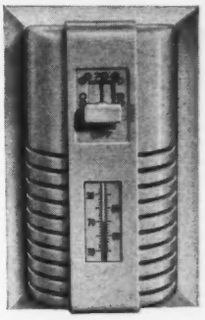

D. H. McCORKLE CO. Box E, Station A, Berkeley, Calif.

tillate lies in what happens to the catalytic oil when it is heated. Unlike the straight-run distillate oil *all* the molecules of the catalytic oil do not crack to simpler molecules that vaporize at lower temperatures when subjected to heat. Some of the molecules in catalytic oil will give us considerable trouble when such oil is heated. We call such compounds "aromatics."

Aromatic moleclules that are present in catalytic oil will "polymerize" upon being heated. This means that upon cracking they will tend to band together to form heavier molecules that are much harder to burn. For instance, an aromatic molecule may crack simply and vaporize at a certain temperature, say 400°. If it bands together with another molecule and forms a heavier compound its vaporizing temperature may double and jump to 800°. It should be obvious from this that the vaporization process could be pretty difficult if enough of these aromatics combined. In fact compounds may be formed that are of such complexity and require so much heat for vaporization that the flame hasn't enough energy to do the job. Then, a hard crystal like carbon or coke is formed that is a greater problem than the soft smoke or carbon resulting from the straight-run distillate that cracks in an environment lacking sufficient air.

The picture of catalytic oil cracking from here on takes a happier shade, for the aromatic molecules will unite with oxygen more freely than they will combine with other molecules. Once more do we come to the absolute necessity of providing adequate amounts of air so that enough oxygen will be present to facilitate its union with the cracked molecules so that these aromatics will not join with others to form heavier molecules, requiring more and more heat to be vaporized.

The problem with catalytic oil then is essentially the same as that with straight-run distillates. The liquid oil must not be overheated and thereby cause extensive cracking before vaporizing, and there must be sufficient air present. The deficiency of air with overheating will give us soot and smoke with straight-run distillates and eventually a hard coke like deposit with catalytic distillates. Since oil cracks both in the liquid and vapor form, the necessary quantity of air with some excess to provide for contingencies must be present *at all times.*

◈

Frank E. Spencer on March 1 retired as manager, Chicago Division Fuel Oil Dept., Socony-Vacuum Oil Co. Born in Centralia, Ill., March 13, 1884, he began his career as an advertising solicitor for the *Chicago Tribune.* Seventeen years later in 1922, he organized Spencer Petroleum Co., having gained experience with the firm of Anderson and Gustafson, Inc. Mr. Spencer's company in 1941 became a division of Socony-Vacuum with Mr. Spencer continuing as its president. Before retiring he was given a testimonial dinner by members of the petroleum industry on February 24 and on February 25 Mr. and Mrs. Spencer were guests at a dinner given by employees of the Fuel Oil Dept., Socony-Vacuum.

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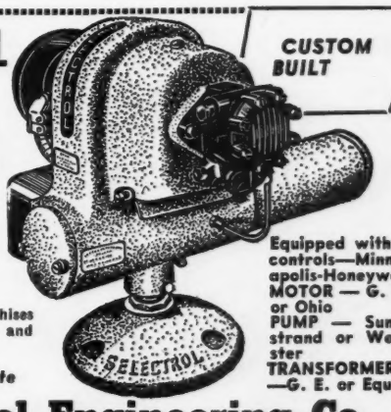

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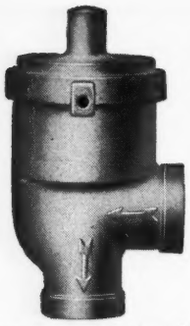

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Permits pumping of oil but closes to prevent syphoning in case of suction line break.

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EVERYTHING FOR THE OIL BURNER TRADE

Catalytic Fuel

(*Continued from page 57*)

i.e. pressure head converted to velocity head. Less pressure head is then available for discharging the oil from the main orifice. Performance curves of nozzle capacity vs. oil viscosity are given in A.S.M.E. Transactions 1939, Vol. 61, pages 373-381. It is suggested that, if possible, nozzles giving 100% turbulent flow should be developed because with such a nozzle, viscosity will have no effect upon its capacity at any given pressure. This is an important item in connection with the nozzle in a high pressure gun type burner. For example, if a high pressure gun type burner were adjusted when it was operating on a long "on"—short "off" cycle at a value of CO_2 of say 11% with a passable amount of smoke, a reduction of oil temperature at the nozzle which would occur when the "on" time of the burner had decreased could cause a 5% increase in the flow rate due to the increase of oil viscosity. The air inlet not having been changed, the value of CO_2 would be higher so that operation of the burner would then be occurring at a higher point on the smoke performance curve. This increase in smoke might then be sufficient to be objectionable. While offhand, the change of flow rate with change of oil viscosity in a nozzle may be considered of little consequence, it can be seen that it is of real importance when the nozzle is used in a burner having a characteristic such that a small change in CO_2 can cause a very pronounced change in smoke density.

In view of the fact that proper matching of the flame and combustion chamber is an essential factor in satisfactory burner performance, the selection of a correct spray angle and capacity nozzle is important. Tests were conducted on three different spray angle nozzles of the same make and capacity in a rectangular combustion chamber and it was found that a 60° angle nozzle gave considerably improved performance over either a 45° or an 80° nozzle. In the case of the 80° nozzle there was considerable flame impingement on the side walls of the combustion chamber resulting in a smoky flame at the areas of impingement. In the case of the 45° nozzle the flame did not touch the side walls but impinged over a small area at the far end of the chamber thereby causing a smoky condition. These tests confirmed the importance of matching the flame with the shape of the combustion chamber.

It is suggested that the nozzle item is one which some oilburner manufacturers would do well to investigate.

Tests conducted on a high pressure gun type burner equipped with a special combustion head indicate considerable improvement in combustion on 100% straight run fuel over that obtained with the two conventional high pressure gun type burners shown on Fig. 2 (page 54). When this combustion head was tested on 100% catalytic fuel using the same settings used with the straight run fuel, unsatisfactory performance was obtained; CO_2 was increased but excess smoke resulted. The performance of this combustion head with straight run fuel is indicated by curve C and that obtained on 100% catalytic fuel with the same settings is represented by curve D.

It is also concluded from experiments with gun type burners that for best performance with respect to smoke and ig-

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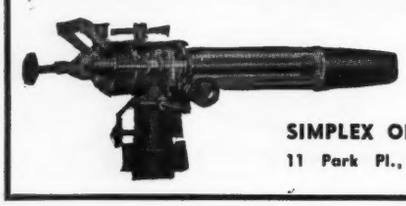

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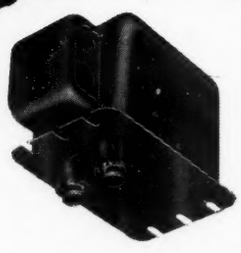

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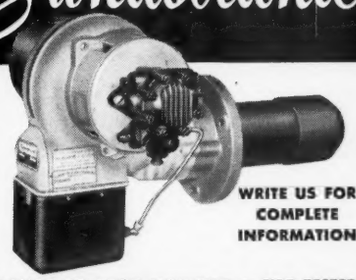

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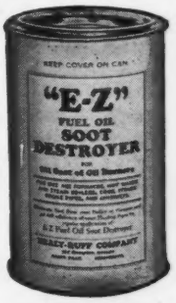

HEALY-RUFF COMPANY
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nition, the nozzle must be properly centered in the air blast tube and axially located correctly with respect to the end of the air blast tube or turbulator.

Fig. 8 (page 57) shows the performance of a typical vaporizing pot burner when operated on kerosene, No. 2 grade straight run and catalytic fuels. It may be seen that this burner is sensitive to change in fueloil type. In this case, the various values of CO_2 are obtained by change in fuel flow rate.

While no analysis of pot burner design has been made, published data[3] indicate that considerable improvement in performance with highly cracked catalytic distillate fueloil can be obtained by simple modifications in existing burners. By the use of a baffle installed in the bottom of the burner, pre-mixing of air and oil is permitted in a relatively low temperature zone to permit vaporization of the oil before subjecting it to the intense heat from the flame existing in the region above the baffle.

This method of modification indicates that with some experimentation on the part of pot type manufacturers they may be able to modify the equipment to handle catalytic fuels successfully. In this case as with other burners, the mixing of air and oil vapors was shown to be important and increased turbulence in the flow of the mixture was desirable.

Fig. 9 shows the properties of the two fuels shown on the performance curves. As previously stated, the present practice of the oil industry is to supply domestic fueloils containing some catalytic cracked distillate. The performance of these fuels is likely to be better than that shown on the curves for the 100% catalytic cracked fuel.

[3] FUELOIL & OIL HEAT, May, 1946, page 77.

The Oil and Gas Journal, August 10, 1946, page 80.

FIG. 9 **Properties of Fuels Tested**

	Straight Run	*Catalytic Cracked*
Gravity—A.P.I.	36.6	26.0
Specific Gravity	0.8418	0.8984
Lb. Per Gal. At 60°F.	7.009	7.481
B.T.U. Per Gal.	137,840	144,300
Viscosity: S.U.V. At 100°F.	34.3	36.0
Flash: PM —°F.	152	195
Distillation, A.S.T.M. D-158-°F.		
Overpoint	360	440
10%	413	482
50%	489	526
90%	587	592
Endpoint	638	630
Sulfur %	0.31	0.60
C:H Ratio	6.56	7.87
Aniline Point—°F.	146.6	94.3
Diesel Index	54	25

◈

Wilson W. Wheeler has joined Askania Regulator Co., Chicago, Ill., manufacturers of industrial controls and instruments, as sales manager. He has been with Askania since 1941 and in 1945 headed sales engineering.

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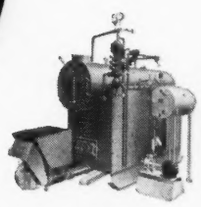

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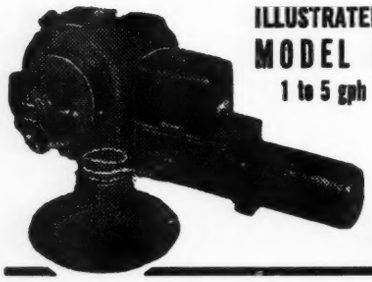

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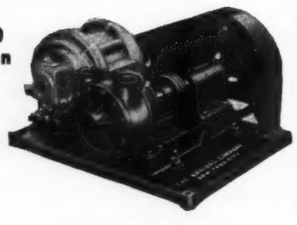

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DEGREE DAY TABLES

ONE MONTH ONLY						SEASON TO DATE (Sept. 1 to Feb. 28)			
Normal	February 1948	February 1949	Percent Change*		Normal	1948	1949	Percent Change*
1174	1355	920	— 21.6	Albany	4862	5536	4087	— 15.9
568	493	373	— 34.3	Atlanta	2045	2453	1995	— 2.4
844	820	592	— 29.9	Baltimore	3413	3519	2701	— 20.9
1027	1118	855	— 16.7	Boston	4215	4501	3565	— 15.4
1168	1153	930	— 20.3	Buffalo	4772	4898	4094	— 14.2
1085	1050	987	— 9.0	Chicago	4539	4729	4135	— 8.9
905	822	660	— 27.0	Cincinnati	3806	3701	2993	— 22.0
1074	1026	824	— 23.2	Clevland	4389	4326	3679	— 16.1
445	534	465	+ 4.4	Dallas	1985	2277	2077	+ 4.6
900	1012	879	— 2.3	Denver	4198	4008	4601	+ 9.5
1143	1200	1229	+ 7.5	Des Moines	4893	4896	4900	+ 0.1
1141	1178	962	— 15.6	Detroit	4738	4866	4145	— 12.5
1150	1157	1005	— 12.6	Grand Rapids	4855	4807	4261	— 12.2
1062	1214	897	— 15.5	Hartford	4425	4919	3930	— 11.1
1155	1290	1412	+ 22.2	Helena	5566	5605	6869	+ 23.4
253	305	188	— 25.7	Houston	1129	1358	1097	— 2.8
982	940	791	— 19.4	Indianapolis	4139	4248	3617	— 12.6
921	986	913	— 0.8	Kansas City	3881	3946	3848	+ 0.8
232	308	348	+ 50.0	Los Angeles	891	934	1420	+ 59.3
824	810	634	— 23.0	Louisville	3432	3560	2839	— 17.2
1181	1184	1157	— 2.0	Milwaukee	5025	5165	4679	— 6.8
1379	1493	1451	+ 5.2	Minneapolis	5981	6167	5817	— 3.7
251	235	120	— 52.2	New Orleans	1045	1484	695	— 33.4
958	980	731	— 24.0	New York	3842	3995	3043	— 20.8
1098	1154	1247	+ 13.6	Omaha	4595	4808	4971	+ 5.8
881	914	675	— 23.3	Philadelphia	3542	3771	2900	— 18.1
971	935	704	— 27.5	Pittsburgh	4042	4293	3254	— 19.5
1184	1258	1085	— 8.3	Portland, Me.	5082	4034	4447	— 12.5
622	655	662	+ 6.4	Portland, Ore.	3073	2904	3544	+ 15.3
1032	1092	801	— 22.3	Providence	4292	4886	3451	— 19.6
865	875	782	— 9.6	St. Louis	3593	3795	3321	— 7.5
868	862	1072	+ 12.3	Salt Lake City	4176	4249	4944	+ 18.3
340	414	466	+ 37.0	San Francisco	1734	1818	2200	+ 26.8
1478	1484	1301	— 11.9	Sault Ste. Marie	6284	6287	5691	— 9.4
644	697	704	+ 9.3	Seattle	3221	3227	3659	+ 13.5
1090	1141	913	— 16.2	Toledo	4553	4886	4035	— 11.3
842	797	576	— 31.6	Washington	3496	3494	2707	— 22.6

*Compared with normal.

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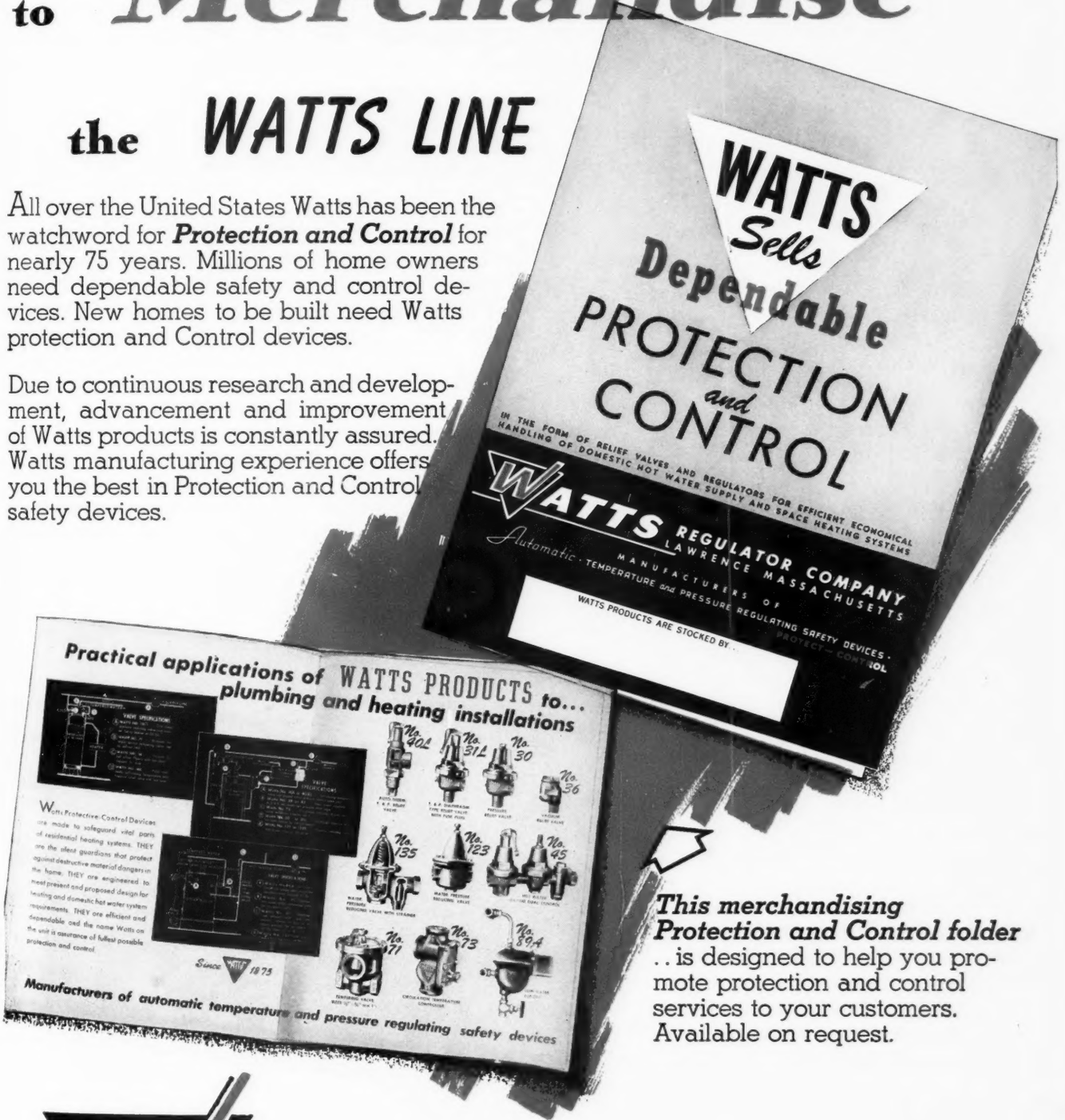

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